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CONTENTS

		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1036 OG	14
Reissue Applications Filed	1036 OG	14
Request for Reexamination Filed	1036 OG	14
Notice of Availability for Licensing	1036 OG	14
Patent Suits	1036 OG	15
Service by Publication	1036 OG	19
Adverse Decisions in Interference	1036 OG	19
Patent Certificates of Correction	1036 OG	20
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1036 OG	21
Condition of Patent Applications	1036 OG	22
Reissue Patents Granted (31,439)		801
Plant Patents Granted (5,137)		803
Patents Granted		
General and Mechanical (4,414,691)		805
Chemical (4,415,331)		1027
Electrical (4,415,758)		1143
Design Patents Granted (271,344)		1235
Reexaminations		1255
Index of Patentees		PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees		PI 49
Classification of		
Patents (Including Reissues and Reexaminations)		PI 53
Designs and Plants		PI 56
Geographical Index of Residence of Inventors		
Patents (Including Reissues)		PI 57
Designs and Plants		PI 58
Change of Address Form and Subscription Order Form		Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
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U.S. Patent and Trademark Office as Searching Authority	
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GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Dec. 3, 1982.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,160,791, Re. S.N. 436,854, Filed Oct. 26, 1982, Cl. 525/860, POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF, Willard S. Highley, et al., Owner of Record: *The United States of America as Represented by the Secretary of Health, Education, and Welfare,* Attorney or Agent: Lawrence I. Lerner, Ex. Gp.: 142

4,343,080, Re. S.N. 527,498, Filed Aug. 29, 1983, Cl. 29/571, METHOD OF PRODUCING A SEMICONDUCTOR DEVICE, Osamu Hataishi, et al., Owner of Record: *Fujitsu Ltd., Kanagawa, Japan,* Attorney or Agent: James D. Halsey, Jr., Ex. Gp.: 111

4,382,492, Re. S.N. 535,966, Filed Sept. 22, 1983, Cl. 188/71.8, DISC BRAKE HAVING A PISTON RETRACTION ASSEMBLY, Irving R. Ritsema, Owner of Record: *Bendix Corp., Southfield, Mich.,* Attorney or Agent: Paul David Schoenle, et al., Ex. Gp.: 314

4,393,911, Re. S.N. 527,410, Filed Aug. 29, 1983, Cl. 152/158, SAFETY LINER FOR TIRES, Mason C. Winfield, Owner of Record: *Astronics Corp., Orchard Park, N.Y.,* Attorney or Agent: Philip K. Fitzsimmons, Ex. Gp.: 161

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,709,369, Reexam. No. 90/000,454, Requested: Oct. 5, 1983, Cl. 210/400, POWER DRIVEN TRANSFER ROLL FOR FLEXIBLE OIL COLLECTOR TUBE, Eugene L. Brill, et al., Owner of Record: *Inventor,* Attorney or Agent: Baldwin, Egan, et al., Ex. Gp.: 176, Requester: Oil Skimmers, Inc., Cleveland, Ohio

3,784,110, Reexam. No. 90/000,460, Requested: Oct. 14, 1983, Cl. 239/304, MIXING AND DISPENSING GUN HAVING A REPLACEABLE NOZZLE, William R. Brooks, Owner of Record: *Insta-Foam Products, Inc., Joliet, Ill.,* Attorney or Agent: Olson, Trexler, et al., Ex. Gp.: 313, Requester: Universal Foam Systems, Inc., Cudahy, Wis.

4,326,938, Reexam. No. 90/000,458, Requested: Oct. 12, 1983, Cl. 204/228, PLANAR CARBON FIBER ELECTRODE STRUCTURE, Sankar Das Gupta, et al., Owner of Record: *HSA Reactors Ltd., Rexdale, Canada,* Attorney or Agent: Lerner, David, et al., Ex. Gp.: 112, Requester: Owner

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

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The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

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DEPARTMENT OF AGRICULTURE

SN 6-370,009 (4,405,806). BROMINE-CONTAINING 2,4-DIAMINOTRIAZINES.

SN 6-212,655 (4,400,391). CONTROLLED RELEASE OF BIOACTIVE MATERIALS USING ALGINATE GEL BEADS.

SN 6-258,489 (4,401,156). CONTROLLED RELEASE OF BIOACTIVE MATERIALS USING ALGI-

NATE GEL BEADS.
SN 6-345,455 (4,400,114). EARTH ANCHOR APPARATUS AND METHOD.
SN 6-258,506 (4,400,983). MECHANICAL BUNCHER FOR LEAFY VEGETABLES.
SN 6-473,396 (4,405,514). PREPARATION OF ESTERS OF RESIN ACIDS, RESINS, ROSINS, AND DERIVATIVES THEREOF.

DEPARTMENT OF COMMERCE

SN 6-300,363 (4,398,293). FREQUENCY STABILIZATION FOR TWO-MODE LASER.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-239,015 (4,397,310). ANASTIGMATIC HIGH MAGNIFICATION, WIDE-ANGLE BINOCULAR INDIRECT ATTACHMENT FOR LASER PHOTOCOAGULATOR.
SN 6-331,989 (4,405,611). BISULFITE STABILIZATION OF 5-AZACYTIDINE.
SN 6-110,293 (4,404,182). ETHIODIZED OIL EMULSION FOR INTRAVENOUS HEPATOGRAPHY.
SN 6-222,936 (4,398,101). FOUR INPUT COINCIDENCE DETECTOR.
SN 6-262,806 (4,403,985). JET CONTROLLED CATHETER.
SN 6-279,443 (4,405,712). LTR-VECTORS.
SN 6-341,572 (4,397,843). MANNOSE-6-PHOSPHATE-LOW DENSITY PROTEIN REAGENT EFFECTIVE AGAINST HYPERCHOLESTEROLEMIA.
SN 6-495,725. MONOCLONAL ANTIBODIES AGAINST NON SMALL CELL LUNG CANCER.
SN 6-339,886 (4,405,720). SILVER STAINS FOR PROTEIN IN GELS.

DEPARTMENT OF THE AIR FORCE

SN 6-512,070. BEAM ADDRESSED MEMORY SYSTEM.
SN 6-307,347 (4,393,198). COPOLYMERS FROM OCTAFLUORONAPHTHALENE.
SN 6-300,761 (4,391,660). COPPER CONTAINING BALLISTIC ADDITIVES.
SN 6-387,580 (4,393,101). DIETHYNYLEBENZENE-ETHYNYLPYRENE COPOLYMERS.
SN 6-512,847. ELECTRODING OF MULTI-LAYERED EPITAXIAL STRUCTURES.
SN 6-515,240. ELEVATED TRANSIENT TEMPERATURE LEAK TEST FOR UNSTABLE MICROELECTRONIC PACKAGES.
SN 6-195,693 (4,392,775). FLAT WORKPIECE PICKUP.
SN 6-232,094 (4,392,624). IMPLANTED BOUNDARY LAYER TRIP.
SN 6-512,062. LOADING DOLLY.
SN 6-283,245 (4,395,469). LOW PRESSURE NICKEL HYDROGEN BATTERY.
SN 6-201,860 (4,392,709). METHOD OF MANUFACTURING HOLOGRAPHIC ELEMENTS FOR FIBER AND INTEGRATED OPTIC SYSTEMS.
SN 6-512,083. MODULAR AIR SHUT-OFF VALVE.
SN 6-506,919. POCKET SIZE ANTENNA MATCH INDICATOR.
SN 6-300,762 (4,395,684). R.F. PRIMED FLASMA LIMITER FOR RADAR RECEIVER PROTECTOR.
SN 6-368,785 (4,393,997). REMOVABLED SECONDARY AIRCRAFT FUEL ENCLOSURE.
SN 6-512,064. SIMULTANEOUS SIGNAL DETECTION FOR IFM RECEIVERS BY TRANSIENT DETECTION.
SN 6-308,973 (4,394,223). TIN AND GOLD PLATING PROCESS.

DEPARTMENT OF THE ARMY

SN 6-510,710. A SOLID PROPELLANT SOUND GENERATOR FOR COAGULATION OF AEROSOLS.
SN 6-510,698. ANTIARMOR WEAPON SYSTEM.
SN 6-524,716. APPARATUS FOR DETERMINING SMR CODES.
SN 6-507,660. DISCRETE STEP ACTUATION SYSTEM.
SN 6-511,602. DUAL FIELD-OF-VIEW OPTICAL TARGET DETECTOR.
SN 6-510,709. ERECTABLE LARGE OPTIC FOR OUTER SPACE APPLICATION.
SN 6-517,613. IMPROVED DIELECTRIC WAVEGUIDE FERRITE RESONANCE ISOLATOR.
SN 6-512,831. INFRARED BEACON.
SN 6-526,848. INTERFERENCE CANCELLING RECEIVER HAVING HIGH ANGULAR RESOLUTION TRANSMITTED RADIATORS.
SN 6-517,191. INTERFERENCE CANCELLING TRANSMITTER.
SN 6-574,423. LIGHT OPERATED MEASURING SYSTEM CROSS-REFERENCE TO RELATED APPLICATION.
SN 6-522,949. LOW POWER RADIO SYNTHESIZER WITH HARMONIC IDENTIFICATION FEATURE.
SN 6-524,614. MAGNETIC FLUID GYRO BEARING AND CAGING MECHANISM.
SN 6-517,614. METHOD AND APPARATUS FOR DISPERSIVE SIGNAL PROCESSING.
SN 6-527,054. OPTICAL INTERFACE TO AN ELECTRICAL CENTRAL OFFICE.
SN 6-519,460. PATIN ANALYSIS PAPER.
SN 6-527,714. PERCUSSION INITIATED SPOTTING CHARGE.
SN 6-525,374. PUSH-PULL PULSED GAS LASER.
SN 6-509,577. QUICK ACCESS SPLICE FOR MISSILE SECTIONS.
SN 6-526,735. SMALL ANGULAR BEAMWIDTH ANTENNA SYSTEM.
SN 6-528,837. SOLID STATE RELAY WITH FAST TURNOFF.
SN 6-224,776. UNSYMMETRICAL POLYNITROCARBONATES AND SYMMETRICAL 1,3-BIS (HALO-AND NITROALKYLCARBONYLDIOXY)-2,2-DINITROPROPANES AND METHODS OF PREPARATION.

DEPARTMENT OF THE INTERIOR

SN 6-168,823 (4,404,523). READOUT CIRCUIT FOR LINEAR DISPLACEMENT TRANSDUCER.
SN 6-348,118 (4,401,632). RECOVERY OF ARSENIC FROM FLUE DUST.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,065,759, Lewis-Parham Corp., HAIR STRAIGHTENING METHOD AND APPARATUS, **filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5863 (KTD), *Lewis-Parham Corp.* v. *Sunbeam Corp.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5866 (KTD), *Lewis-Parham Corp.* v. *Braun.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5867, *Lewis-Parham Corp.* v. *Schick, Inc.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5868 (KTD), *Lewis-Parham Corp.* v. *Macy & Co., Inc.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5869 (KTD), *Lewis-Parham Corp.* v. *The Gillette Co.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5870, *Lewis-Parham Corp.* v. *Korvettes, Inc.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5871, *Lewis-Parham Corp.* v. *General Electric.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5872, *Lewis-Parham Corp.* v. *Sperry Remington.* **Same, filed** Oct. 30, 1979, D.C., S.D.N.Y., Doc. 79-Civ-5873 (KTD), *Lewis-Parham Corp.* v. *North American Philips Corp.*

3,092,060, Donald V. Reid, FLYING SUBMARINE, **filed** June 12, 1978, D.C., S.D. Fla. (Ft. Lauderdale),

Doc. 78-8185-CIV-NCR, *Donald V. Reid* v. *U.S. Government.*

3,108,261, Ampex Corp., RECORDING AND/OR REPRODUCING SYSTEM, **filed** Nov. 24, 1978, U.S. Ct. of Claims (Wash. D.C.), Doc. 513-78, *Ampex Corp.* v. *The United States.*

3,116,835, Theodore A. Brandon, LUMBER SORTING AND ACCUMULATING MECHANISMS, **filed** Dec. 28, 1979, D.C., W.D. Wash. (Tacoma), Doc. C79-575T, *Theodore A. Brandon* v. *Boise Cascade Corp., et al.*

3,216,674, Walter G. Finch, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE; **4,093,154, same,** TARGET SEEKING GYRO FOR A MISSILE; **Re. 26,887, same,** PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, **filed** Jan. 11, 1980, D.C. Md. (Baltimore), Doc. J-80-0055, *Walter G. Finch, et al.* v. *Hughes Aircraft Co.*

3,258,394, Shell Oil Co., DIMETHYL-1-METHYL-2-(METHYL CARBAMOYL) VINYL PHOSPHATE INSECTICIDE AND METHOD OF USE, **filed** Oct. 9, 1979, D.C., S.D. Calif. (San Diego), Doc. 79-1722-E, *Shell Oil Co.* v. *Jessen and Co., Inc.* Defendant is enjoined and restrained from further infringing Plaintiff's patent. **Filed** Jan. 15, 1980. **Same, filed** Jan. 2, 1980, D.C., S.D. Calif. (San Diego), Doc. 80-0002-N, *Shell Oil Co.* v. *Fifield Land Co., Inc.* Defendant has agreed not to commit any further acts of infringement of Pat. No. 3,258,394. Action is dismissed with prejudice with each party to bear its own costs. Filed July 28, 1980.

3,290,845, Butler Mfg. Co., PREFABRICATED INSULATED PANEL SYSTEM, **filed** Jan. 7, 1980, D.C., W.D. Okla. (Oklahoma City), Doc. Civ-80-016-D, *Butler Mfg. Co.* v. *Star Mfg. Co. of Oklahoma.* Claim and counterclaim dismissed with prejudice with each party to bear its own costs. Filed June 30, 1980.

3,298,322, Eugene L. Sherrod, PUMP FOR SEMI-FLUID MATERIALS; **3,380,388, same,** AUTOMATIC CONTROL SYSTEM FOR CONCRETE PUMP; **3,465,685, same,** SELF-CLEARING ROTATING CONVEYOR, **filed** Dec. 19, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75-3650, *Eugene L. Sherrod and Frances L. Sherrod* v. *Allentown Pneumatic Gun Co.* Complaint and counterclaim dismissed with prejudice and without costs to either party. Filed July 15, 1977.

3,308,065, The Dow Chemical Co., SCALE REMOVAL, FERROUS METAL PASSIVATION AND COMPOSITIONS THEREFOR; **3,413,160, same,** PASSIVATION OF FERROUS METAL SURFACE; **3,438,811, same,** REMOVAL OF COPPER CONTAINING INCRUSTATIONS FROM FERROUS SURFACES, **filed** Mar. 17, 1978, D.C., N.D. Miss. (Oxford), Doc. GC7831-K-P, *The Dow Chemical Co.* v. *Halliburton Co.*

3,308,065, The Dow Chemical Co., SCALE REMOVAL, FERROUS METAL PASSIVATION AND COMPOSITIONS THEREFOR; **3,438,811, same,** REMOVAL OF COPPER CONTAINING INCRUSTATIONS FROM FERROUS SURFACES, **filed** Mar. 17, 1978, D.C., N.D. Miss. (Oxford), Doc. GC78320-K, *The Dow Chemical Co.* v. *Miss. Power & Light Co.*

3,328,961, Twin Disc, Inc., MULTIPLE STAGE, HYDRAULIC JET PROPULSION APPARATUS FOR WATER CRAFT; **3,405,526, same, filed** Nov. 21, 1978, U.S. Ct. of Claims (Wash. D.C.), Doc. 508-78, *Twin Disc, Inc.* v. *The United States.*

3,344,692, David Volk, METHOD AND APPARATUS FOR PRODUCING ASPHERIC CONTACT LENSES; **3,482,906, same,** ASPHERIC CORNEAL CONTACT LENS SERIES; **3,535,825, same,** METHOD AND APPARATUS FOR GRINDING AND POLISHING ASPHERIC SURFACES OF REVOLUTION, **filed** Aug. 2, 1979, D.C., N.D. Ohio (Cleveland), Doc. C 79-1510, *David Volk* v. *Breger-Mueller Welt Corp.*

3,380,388. **(See 3,298,322.)**

3,405,526. **(See 3,328,961.)**

3,413,160. **(See 3,308,065.)**

3,414,928, Jerome H. Lemelson, COMBINATION SPONGE AND SCOURER, **filed** Oct. 30, 1979, D.C., N.D. Tex. (Dallas), Doc. 3-79-1354-G, *Jerome H. Lemelson* v. *Minnesota Mining & Mfg. Co.* Motion for Defendant for summary judgment is granted on Feb. 4, 1980.

3,418,708, Chester A. Siver, METHOD OF MAKING VALVES BY ELECTRON BEAM WELDING, **filed** Jan. 8, 1980, D.C., W.D. Pa. (Pittsburgh), Doc. 80-31, *Conval, Inc. and Chester A. Siver* v. *Kerotest Mfg. Corp.*

3,438,811. **(See 3,308,065.)**

3,465,685. **(See 3,298,322.)**

3,482,906. **(See 3,344,692.)**

3,489,042, The Warner & Swasey Co., TOOLHOLDER; **3,664,215, same,** MACHINE TOOL WITH BAR STOCK GRIPPER; **3,691,879, same,** MACHINE TOOL; **3,798,722, same,** COUPLING ASSEMBLY; **3,835,516, same,** MACHINE TOOL WITH INDEXIBLE TOOL SUPPORT; **3,877,323, same,** TURRET INDEXING MACHINE, **filed** Nov. 21, 1979, D.C., N.D. Ohio (Cleveland), Doc. C78-2190, *The Warner & Swasey Co.* v. *Yamazaki Machinery Works, Ltd.*

3,507,547, Warren R. Thomas, TELESCOPE HAVING MULTIPLE OBJECTIVE MIRRORS, **filed** Jan. 16, 1980, U.S. Ct. of Claims (Wash. D.C.), Doc. 27-80 C, *Warren R. Thomas* v. *The United States.* **Same, filed** Mar. 12, 1980, D.C. Ariz. (Phoenix), Doc. 80-175-PHX, *Warren R. Thomas* v. *The Board of Regents of the State of Arizona, et al.*

3,519,309, Kennametal, Inc., ROTARY CONE BIT RETAINED BY CAPTIVE KEEPER RING; **3,752,515, same,** RESILIENT KEEPER RING, **filed** Aug. 20, 1979, D.C., N.D. Ohio (Cleveland), Doc. C79-1613, *Kennametal, Inc.* v. *Austin Powder Co., Inc.* **Same, filed** Sept. 4, 1980, D.C., E.D. Mich. (Detroit), Doc. 80-73376, *Kennametal, Inc.* v. *Border City Tool & Mfg. Co., Inc.*

3,535,825. **(See 3,344,692.)**

3,565,454, Richard Lawrence Stevenson, SKATEBOARD WITH INCLINED FOOT-DEPRESSIBLE LEVER, **filed** July 3, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75-2297, *Richard Lawrence Stevenson* v. *Grentec, Inc., et al.* Case closed on Nov. 30, 1979. **Same, filed** Sept. 24, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75-3233-ALS, *Richard Lawrence Stevenson* v. *Grentec, Inc.* Case closed on Nov. 30, 1979.

3,613,004, Keith H. Wycoff, SEQUENTIAL TONE SELECTIVE CALLING COMMUNICATION SYSTEM AND COMPONENTS THEREOF; **3,932,824, same,** SIGNAL SELECTIVE CIRCUIT; **Re. 28,222, same,** COMMUNICATION RECEIVER INCORPORATING TONE OPERATED PULSER CIRCUIT AND ELECTRONIC SWITCH, **filed** Sept. 20, 1979, D.C., N.D. Ill. (Chicago), Doc. 79 C 3923, *Keith H. Wycoff, et al.* v. *Nippon Electric Co., Ltd., et al.*

3,664,215. **(See 3,489,042.)**

3,691,879. **(See 3,489,042.)**

3,748,682, Oil Mop, Inc., OIL MOP; **3,999,232,** Pro Diet Mop, Inc., DIETARY CONTROL GREASE MOP, **filed** Dec. 11, 1979, D.C., S.D.N.Y., Doc. 79-Civ-6719 MJL, *Pro Diet Mop, Inc. and Oil Mop, Inc.* v. *Empire Brushes, Inc., et al.*

3,752,515. **(See 3,519,309.)**

3,777,384, Sturm, Ruger & Co., Inc., MECHANISM

FOR SINGLE ACTION FIREARM, **filed** Sept. 19, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77 C 1858, *Sturm, Ruger & Co., Inc.* v. *United Sporting Arms, Inc.* **Same, filed** Oct. 19, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77 C 2081, *Sturm, Ruger & Co., Inc.* v. *U.S. Arms Corp.* **Same, filed** Jan. 23, 1980, D.C. Ariz. (Tuscon), Doc. 80-19-TUC MAR, *Sturm, Ruger & Co.* v. *United Sporting Arms of Ariz., Inc., et al.* Final Judgment filed June 17, 1981.

3,798,722. (See 3,489,042.)

3,835,516. (See 3,489,042.)

3,847,489, Robert S. Van Riper, NOVEL FASTENER DEVICE, **filed** Jan. 12, 1979, D.C.N.J. (Newark), Doc. 79-123, *Robert S. Van Riper* v. *Construction Specialties, Inc.*

3,852,041, General Motors Corp., LOW PROFILE CATALYTIC CONVERTER, **filed** Jan. 26, 1976, D.C., S.D. Ohio (Dayton), Doc. C-3-76-28, *General Motors Corp.* v. *Toyota Motor Co., Ltd., et al.* Claims 5–8 of Pat. No. 3,852,041 are invalid for obviousness. Because claims 5–8 are invalid, General Motors' infringement allegations and Toyota's unenforceability allegation need not be examined. Each party to pay its own costs. Filed Feb. 1, 1979.

3,852,882, Bettcher Industries, Inc., AIR DRIVEN BONING AND TRIMMING KNIVES, **filed** Jan. 24, 1980, D.C., N.D. Ohio (Toledo), Doc. 80-32, *Bettcher Industries, Inc.* v. *Food Industry Equipment Intl., Inc.* Consent Judgment Order filed Nov. 10, 1981.

3,877,323. (See 3,489,042.)

3,882,751, Nippon Gakki Seizo Kabushiki Kaisha, ELECTRONIC MUSICAL INSTRUMENT EMPLOYING WAVESHAPE MEMORIES; **4,036,096, same,** MUSICAL TONE WAVESHAPE GENERATOR; **4,161,128, same,** ELECTRONIC MUSICAL INSTRUMENT; **Re. 30,736, same,** TONE WAVE GENERATOR IN ELECTRONIC MUSICAL INSTRUMENT; **Re. 30,834, same,** ELECTRONIC MUSICAL INSTRUMENT; **Re. 30,906, same,** ENVELOPE GENERATOR; **Re. 31,004, same,** ELECTRONIC MUSICAL INSTRUMENT UTILIZING DATA PROCESSING SYSTEM, **filed** Sept. 14, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV-81-2977-WPG, *Nippon Gakki Seizo Kabushiki Kaisha* v. *Casio, Inc., et al.*

3,932,824. (See 3,613,004.)

3,935,858, Orthopedic Equipment Co., Inc., KNEE IMMOBILIZER, **filed** Jan. 16, 1980, D.C., E.D. Mich. (Detroit), Doc. 80-70188, *Orthopedic Equipment Co., Inc.* v. *All Orthopedic Appliances, Inc.*

3,999,232. (See 3,748,682.)

4,016,624, Victor F. Weaver, Inc., POULTRY CUT-UP MACHINE, **filed** June 21, 1983, D.C., N.D. Ga. (Atlanta), Doc. C83-1300A, *Cagles, Inc.* v. *U.S. Industries, Inc., et al.*

4,016,711, Up-Right, Inc., VINE-FRUIT HARVESTING MACHINE WITH INCLINED TIP STRIKER RODS; **4,250,700, same,** SHAKER-STRIKER VINE HARVESTER, **filed** May 14, 1981, D.C., E.D. Calif. (Fresno), Doc. CV-F-81-196-MDC, *Up-Right, Inc.* v. *Chisholm-Ryder Co., Inc.*

4,023,623, Chromalloy American Corp., CULTURAL IMPLEMENT WITH FOLDABLE TOOL SUPPORTING FRAME, **filed** Mar. 24, 1978, D.C., S.D. Miss. (Biloxi), Doc. S78-0080 (C), *Chromalloy American Corp.* v. *Poplarville Mfg. Co.* Consent judgment filed Jan. 22, 1980.

4,030,005, Papst Motoren GmbH & Co., KG, BRUSHLESS D.C. MOTOR HAVING ROTOR POSITION-DEPENDENT CONTROL MEANS; **4,322,666, same,** BRUSHLESS, PERMANENT MAGNET D-C PULSE CURRENT CONTROLLED, ESSENTIALLY UNIFORM TORQUE DYNAMO ELECTRIC MACHINE PARTICULARLY MOTOR; **4,371,817, same,** BRUSHLESS, PERMANENT MAGNET D-C PULSE CURRENT CONTROLLED ESSENTIALLY UNIFORM TORQUE DYNAMO ELECTRIC MACHINE, PARTICULARLY MOTOR, **filed** June 3, 1983, D.C.N.J. (Newark), Doc. 83-2060, *Matsushita Electric Corp.* v. *Papst Motoren GmbH & Co., KG, et al.*

4,033,136, Robert C. Stewart, VAPOR ACTUATED POWER GENERATING DEVICE; **4,285,201, same,** VAPOR POWERED ENGINE ASSEMBLY, **filed** Mar. 9, 1983, D.C. Nev. (Las Vegas), Doc. CV-LV-83-167-HEC, *Quantum Energy, Inc.* v. *Robert C. Stewart, et al.*

4,036,096. (See 3,882,751.)

4,038,769, Sign-Up Corp., PORTABLE SIGN HOLDER, **filed** Sept. 17, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-73488, *Sign-Up Corp.* v. *Marketing Displays, Inc.* Stipulated Dismissal and Order filed May 24, 1983.

4,044,444, Richard T. Harris, TUBE TRAVELER, **filed** Oct. 18, 1982, D.C., E.D. Va. (Norfolk), Doc. 82-774-N, *Richard T. Harris* v. *Atlantic Nuclear Services, Inc.* Consent Judgment filed June 9, 1983.

4,057,704, Alexander Binzel Corp., GAS SHIELDED ARC WELDING TORCH, **filed** May 24, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 3558, *Alexander Binzel Corp.* v. *K & K Brothers Corp., et al.*

4,090,267, Casper Cuschera, SELF CAULKING TOILET DRAIN, **filed** Sept. 27, 1982, D.C., E.D. Tex. (Tyler), Doc. TY-82-507-CA, *Casper's Industries, Inc. and Casper Cuschera* v. *Tyler Pipe Industries.* Plaintiff dismisses action with prejudice as to facts alleged in Complaint. Dismissal is without prejudice to plaintiff's right to file an action in the event of breach of said Non-Exclusive License Agreement or for patent infringement should said License Agreement be terminated. Filed May 26, 1983.

4,093,154. (See 3,216,674.)

4,109,545, Enakichi Hayasaka, NOISELESS SPUR GEARS, **filed** July 22, 1983, D.C., N.D. Ohio (Cleveland), Doc. C83-3011, *Enakichi Hayasaka* v. *Matex Kabushiki Kaisha, et al.*

4,117,644, Roger Neil Weinar, WALLBOARD FASTENER, **filed** Oct. 31, 1979, D.C., E.D. Mich. (Ann Arbor), Doc. 79-74172, *Roger Neil Weinar* v. *Rollform, Inc., et al.* Rollform, Inc. is hereby enjoined from further infringing U.S. Pat. No. 4,117,644. Judgment dated May 20, 1983.

4,126,354, Stadiums Unlimited, Inc., BENCH SEATS WITH END ALIGNING AND REINFORCING INSERTS, **filed** Dec. 16, 1981, D.C., M.D. Ala. (Montgomery), Doc. 81-0142-S, *Stadiums Unlimited, Inc.* v. *Outdoor Aluminum, Inc.* Order of Dismissal filed May 16, 1983.

4,126,546, Rederiaktiebolaget Nordstjernan, METHOD FOR THE FILTRATION OF A SUSPENSION OR EMULSION; **4,197,201, same,** APPARATUS FOR THE FILTRATION OF A SUSPENSION OR EMULSION, **filed** July 6, 1982, D.C. Dist. of Columbia (Wash. D.C.), Doc. 82-1877, *DMP Corp.* v. *Rederiaktiebolaget Nordstjernan.* Memorandum Opinion and Order granting motion of Defendant to dismiss complaint under Rule 12(b) (1) filed Apr. 14, 1983.

4,132,029, Positive Pyramids, Inc., PYRAMID FLYER, **filed** Oct. 13, 1982, D.C. Colo. (Denver), Doc. 82-C-1709, *Pyramid Creations, Inc.* v. *Positive Pyramids, Inc.* Judgment filed Dec. 1, 1982.

4,133,304, EMDE Corp., SYRINGE LIKE APPARATUS WITH REMOVABLE CAPILLARY CARTRIDGE, **filed** Jan. 15, 1980, D.C. Colo. (Denver),

Doc. 80-K-61, *Marquest Medical Products, Inc.* v. *EMDE Corp.* U.S. Pat. No. 4,133,304 is good and valid in law. The "Omnistik" and "Ministik" syringes presently made, used or sold by plaintiff do not infringe U.S. Pat. No. 4,133,304. Each party shall bear its own costs. Consent Decree filed Apr. 25, 1983.

4,139,955, Earl Reiback, DISPLAY DEVICE, **filed** July 26, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5536 WCC, *Earl Reiback* v. *Paramount Pictures Corp.*

4,161,128. (See 3,882,751.)

4,165,963, Rheem Mfg. Co., HOT WATER HEATER BURNER ASSEMBLY, **filed** May 11, 1983, D.C., M.D. Tenn. (Nashville), Doc. 3-83-0362, *State Industries, Inc.* v. *Rheem Mfg. Co.*

4,170,293, Cambelt Intl. Corp., ENCLOSED CONVEYOR, **filed** June 28, 1983, D.C., S.D. Ohio (Columbus), Doc. C-2-83-1164, *Cambelt Intl. Corp.* v. *Ashland Oil, Inc., et al.*

4,183,188, Claude W. Goldsby, SIMULATED BRICK PANEL, COMPOSITION AND METHOD, **filed** Apr. 19, 1983, D.C. Oreg. (Portland), Doc. 83-546, *Cast Products Corp.* v. *Claude W. Goldsby.*

4,197,201. (See 4,126,546.)

4,207,851, Charles Crisefi, EMERGENCY IGNITION FOR INTERNAL COMBUSTION ENGINES, **filed** May 29, 1980, D.C., M.D. Fla. (Tampa), Doc. 80-633 Civ.T.G.C., *E-Virotronics, Inc.* v. *Charles Crisefi, et al.* Pat. No. 4,207,851 is hereby declared invalid and unenforceable per Stipulated Permanent Injunction filed Oct. 1, 1982.

4,207,921, Albert H. Sloan, HEADER ASSEMBLY AND JETTING ADAPTER FOR WELL POINT PUMPING APPARATUS; **4,261,601, same,** JETTING ADAPTER FOR WELL POINT PUMPING APPARATUS, **filed** July 6, 1983, D.C., S.D. Fla. (W. Palm Beach), Doc. 83-6496-Civ-JCP, *Albert H. Sloan* v. *Well Point Dewatering Rental & Mfg., Inc., et al.*

4,208,131, Robert L. Mendenhall, ASPHALTIC CONCRETE PATCH MIXING AND HEATING APPARATUS AND METHOD; **4,219,278, same,** ASPHALT-AGGREGATE DRUM MIXING APPARATUS; **4,240,754, same,** ASPHALTIC CONCRETE PATCH MIXING AND HEATING APPARATUS AND METHOD; **4,265,546, same,** ASPHALT-AGGREGATE DRUM MIXING APPARATUS, **filed** Oct. 2, 1981, D.C. Mont. (Butte), Doc. CV-81-93-BU, *Robert L. Mendenhall* v. *Eugene R. Simpson, doing business as Simpson Mfg. Co.* Defendant is permanently enjoined from further infringement of Plaintiff's patents. Filed June 1, 1983.

4,219,278. (See 4,208,131.)

4,222,318, Patton, Patton and O'Donnell, COMBINATION WINDOW AND FLOOR FAN, **filed** July 1, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-3160, *Patton Electric Co., Inc.* v. *Lasko Metal Products, Inc.*

4,232,477, Shelcore, Inc., INFLATABLE HASSOCK-SHAPED TOY, **filed** Dec. 21, 1982, D.C.N.J. (Newark), Doc. 82-4309, *Shelcore, Inc.* v. *Glenco Infant Items, Inc.* Stipulation and Order of Dismissal of action filed Aug. 3, 1983.

4,232,501, Lantech, Inc., ECONOMY AUTOMATIC WRAPPING APPARATUS, **filed** June 6, 1983, D.C. Colo. (Denver), Doc. 83-JM-991, *Lantech, Inc.* v. *Master Conveyor Corp.*

4,240,754. (See 4,208,131.)

4,241,880, Nordson Corp., ELECTROSTATIC SPRAY GUN, **filed** Apr. 1, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-71186, *Nordson Corp.* v. *Graco, Inc.* Plaintiff is the owner of Pat. No. 4,241,880 which is good and valid in law and enforceable. Defendant is permanently restrained from further infringing Plaintiff's patent. Filed June 28, 1983.

4,250,700. (See 4,016,711.)

4,253,845, Analytical Products, Inc., GAS-LIQUID EQUILIBRATION APPARATUS, **filed** May 4, 1983, D.C., N.D. Calif. (San Jose), Doc. C-83-20003 WAI, *Analytical Products, Inc.* v. *Corning Glass Works.*

4,258,250, Copar Corp., JAM DETECTOR, **filed** June 22, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 4316, *Copar Corp.* v. *Valco Cincinnati, Inc.*

4,261,601. (See 4,207,921.)

4,265,546. (See 4,208,131.)

4,285,201. (See 4,033,136.)

4,291,524, Alloway Mfg., Inc., METHOD OF DEFOLIATING; **4,308,714, same,** THREE DRUM DEFOLIATOR, **filed** Aug. 27, 1982, D.C. N. Dak. (Fargo), Doc. A3-82-139, *Alloway Mfg., Inc.* v. *WIC, Inc., et al.* Stipulation and Order of Dismissal filed on June 7, 1983.

4,308,714. (See 4,291,524.)

4,308,901, Ag-Bag Corp., AGRICULTURAL BAG LOADING APPARATUS BRAKING MECHANISM, **4,337,805, same,** AGRICULTURAL BAG LOADING APPARATUS, **filed** July 1, 1983, D.C., W.D. Pa. (Pittsburgh), Doc. 83-1636, *Ag-Bag Corp.* v. *Clarence Mowry.*

4,315,763, Stoller Enterprises, Inc., HIGH ANALYSIS LIQUID FERTILIZERS, **filed** July 6, 1983, D.C. Idaho (Boise), Doc. 83-1288, *Stoller Enterprises, Inc., et al.* v. *Ferti-Spec, Inc., et al.*

4,321,038, Van R Dental Products, Inc., BRAIDED GINGIVAL RETRACTION CORD, **filed** Dec. 20, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6662, *Van R Dental Products, Inc.* v. *Pascal Co., Inc.* Plaintiff's dismissal of complaint filed on May 31, 1983.

4,322,666. (See 4,030,005.)

4,337,805. (See 4,308,901.)

4,342,796, Advanced Chemical Technologies, Inc., METHOD FOR INHIBITING CORROSION OF INTERNAL STRUCTURAL MEMBERS OF REINFORCED CONCRETE, **filed** Apr. 14, 1983, D.C., W.D. Okla. (Oklahoma City), Doc. 83-822-E, *Dynamit Nobiel of America, Inc., et al.* v. *Advanced Chemical Technologies, Inc., et al.*

4,366,730, Roberto Casadio, WIRE STRIPPING PLIERS, **filed** July 8, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-4137, *Creative Pioneer Products Corp. and Roberto Casadio* v. *K-Mart Corp.* **Same, filed** Aug. 11, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-5017, *Creative Pioneer Products Corp. and Roberto Casadio* v. *Capital Tools of Tex., et al.*

4,371,817. (See 4,030,005.)

4,380,327, Robert E. Fish, SAFETY BARRIER, **filed** July 26, 1983, D.C., S.D. Fla. (Ft. Lauderdale), Doc. 83-6557-Civ-JAG, *Robert E. Fish* v. *Roll-A-Way Protective Pool Fence, Inc.*

4,384,801, East-West Design, Inc., JUNCTION PLATE, **filed** May 24, 1983, D.C. Minn. (Minneapolis), Doc. 4-83 Civil 428, *United Steel Products Co.* v. *East-West Design, Inc.*

4,394,055, Richard D. Smith, CABINET FOR VIDEO GAME CONSOLES, CARTRIDGES, ACCESSORIES, AND INSTRUCTION BOOKLETS, **filed** July 21, 1983, D.C. Minn. (St. Paul), Doc. 3-83-898, *Richard D. Smith* v. *Hartzell Corp., Inc., et al.* **Same, filed** July 22, 1983, D.C., N.D. Calif. (San Jose), Doc. C-83-20155 WAI, *Richard D. Smith* v. *Imagic, Inc., et al.* **Same, filed** July 26, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5531 KTD, *Richard D. Smith* v. *Service Mfg. Co.*

Re. 26,887. (See 3,216,674.)

Re. 28,222. (See 3,613,004.)

Re. 30,736. (See 3,882,751.)

Re. 30,834. (See 3,882,751.)

Re. 30,906. (See 3,882,751.)

Re. 31,004. (See 3,882,751.)

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

National Energy Management Systems, Inc., Fort Lauderdale, Fla., Reg. No. 1,140,667, for the mark "NEMS MICROMASTER" and design, Canc. No. 13,266.

File-O-Fax Corp., Snyder, N.Y., Reg. No. 903,002, for the mark "FILE-O-FAX" and design, Canc. No. 13,519.

Merri Dee Cosmetics, Inc., Chicago, Ill., Reg. No. 1,199,234, for the mark "MERRI DEE" and design, Canc. No. 13,698.

Charmaceuticals, Inc., Los Angeles, Calif., Reg. No. 849,581, for the mark "PLUS ULTRA", Canc. 13,760.

Maxine Anderson, assignee of The Du-Dad Lure Co., Dorchester, Wis., Reg. No. 817,710, for the mark "DU-DAD", Canc. No. 13,785.

Pro-Vita Corp., Anaheim, Calif., Reg. No. 1,132,544, for the mark "ULTIMATE", Canc. No. 13,792.

Cosmetically Yours, Inc., Yonkers, N.Y., Reg. No. 846,787, for the mark "FORTUNE KOOKIE", Canc. No. 13,825.

Golf Marks, N.V., Cleveland, Ohio, Reg. No. 790,280, for the mark "BLACK KNIGHT", Canc. No. 13,867.

ERMA S. BROWN,
Deputy Clerk,
Trademark Trial and
Appeal Board.

For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,085,042, Christian B. Luginbuhl, PHYTOTOXICITY OF MANGANESE ETHYLENE-BISDITHIOCARBAMATE REDUCED BY THE ADDITION OF ZINC AND CADMIUM IONS, Interference No. 94,033, decided May 31, 1967, claims 2, 5 & 7.

Patent No. 3,967,740, Desmond Walter Molins, ARTICLE-HANDLING APPARATUS, Interference No. 100,194, decided May 23, 1983, claims 23–26.

Patent No. 4,017,656, Henry R. Lasman, Robert J. Lebenson and Reuben Wisotzky, IMITATION LEATHER MATERIAL AND METHOD OF PREPARING SUCH MATERIAL, Interference No. 100,951, decided July 27, 1983, claims 1–33.

Patent No. 4,098,016, John P. Foote, AUTOMATIC AND SEMIAUTOMATIC SMALL CALIBER CONVERSION SYSTEM, Interference No. 100,221, decided June 23, 1983, claims 1, 2 & 3.

Patent No. 4,104,193, Walter H. Carter, Charles A. Christopher and Thomas Jefferson, IMPARTING SUPERIOR VISCOSITY TO AQUEOUS POLYSACCHARIDE SOLUTIONS, Interference No. 100,490, decided June 20, 1983, claims 1–8.

Patent No. 4,133,043, Minoru Hiroshima, Shigeru Yoshizawa, Nobuo Saito, Atsushi Asano, Hiroshi Suehiro, Minoru Saitoh and Keisuke Mise, SHIFT REGISTER TYPE MEMORY, Interference No. 100,438, decided Apr. 27, 1983, claims 1–4 & 11.

Patent No. 4,169,833, Marcel Menard and Gilles Caron, NOVEL PHOSPHORANE INTERMEDIATES FOR USE IN PREPARING PENEM ANTIBIOTICS, Interference No. 101,012, decided June 24, 1983, claims 1 & 2.

Patent No. 4,176,667, Julian N. Herring, DISPOSABLE LIQUID ABSORBENT PAD AND METHOD, Interference No. 100,933, decided Aug. 30, 1983, claims 1 & 3.

Patent No. 4,192,652, Robert H. Smith, PROCESS FOR PREPARING SULFUR-CONTAINING COAL OR LIGNITE FOR COMBUSTION HAVING LOW SO2 EMISSIONS, Interference No. 100,844, decided July 22, 1983, claims 1, 2, 4–6.

Patent No. 4,207,876, Larry D. Annis, COMPRESSION DEVICE WITH VENTILATED SLEEVE, Interference No. 100,963, decided Sept. 23, 1983, claims 1–6.

Patent No. 4,226,601, Robert H. Smith, PROCESS FOR REDUCING SULFUR CONTAMINANT EMISSIONS FROM BURNING COAL OR LIGNITE THAT CONTAINS SULFUR, Interference No. 100,845, decided July 22, 1983, claims 1–4, 6 & 8.

Patent No. 4,242,395, Joseph L. Zuckerman and John W. Bzik, THERMOPLASTIC COMPOSITIONS AND AUTOMOTIVE CARPETING BACKED THEREWITH, Interference No. 100,870, decided Sept. 23, 1983, claims 1–4.

Patent No. 4,242,942, Reiner Bartholomaus, Karl-Heinz Bernhardt, Wolfgang Eberhard, Hans-Dieter Kokus, Herbert Lembke and Heinz Schulte, HYDRAULIC POSITIONER WITH FEEDBACK DEVICE, Interference No. 100,985, decided Sept. 23, 1983, claims 9 & 10.

Patent No. 4,253,432, Hidetaka Nohira, Toshiaki Konomi and Hideaki Matsui, INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE OF A COUNTER-FLOW TYPE, Interference No. 101,006, decided July 19, 1983, claims 1–5 & 15–19.

Patent No. 4,260,669, Catherine A. Kerg, ALKALINE-MNO2 CELL HAVING A ZINC POWDER-GEL ANODE CONTAINING STARCH GRAFT COPOLYMER, Interference No. 100,730, decided June 23, 1983, claims 1–4 & 7–11.

Patent No. 4,264,613, Gilbert Regnier, Alain Dhainaut, Jacques Duhault and Michelle Boulanger, PIPERIDYLBENZIMIDAZOLINONE COMPOUNDS, Interference No. 101,009, decided June 14, 1983, claims 1 & 2.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 15, 1983

Re. 30,906	4,377,031	4,393,152	4,400,403
Re. 31,281	4,377,149	4,393,282	4,400,917
3,978,457	4,377,332	4,393,724	4,400,930
4,112,308	4,377,333	4,393,936	4,401,101
4,180,740	4,378,706	4,394,679	4,401,269
4,238,220	4,379,755	4,395,098	4,401,289
4,286,122	4,380,875	4,395,328	4,401,482
4,289,404	4,380,982	4,395,458	4,401,822
4,294,822	4,382,194	4,395,676	4,402,063
4,304,727	4,382,611	4,396,005	4,402,462
4,311,494	4,382,677	4,396,390	4,402,742
4,323,094	4,383,038	4,396,425	4,402,760
4,327,151	4,383,608	4,396,448	4,402,797
4,329,929	4,384,687	4,396,725	4,403,131
4,331,751	4,384,786	4,396,869	4,403,255
4,338,376	4,385,191	4,397,163	4,403,412
4,339,361	4,385,472	4,397,189	4,403,551
4,351,146	4,388,565	4,397,597	4,403,764
4,355,357	4,389,007	4,397,712	4,403,798
4,357,601	4,389,468	4,397,810	4,403,804
4,360,777	4,389,498	4,398,253	4,404,204
4,366,959	4,390,452	4,398,923	4,404,238
4,368,472	4,392,046	4,399,544	4,404,269
4,371,969	4,392,416	4,399,550	4,404,392
4,373,016	4,392,722	4,399,907	
4,375,999	4,393,113	4,400,280	

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	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
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Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REISSUES

NOVEMBER 15, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,439

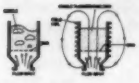
PROCESS FOR OPERATING A MAGNETICALLY STABILIZED FLUIDIZED BED

Ronald E. Rosensweig, Summit, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Original No. 4,115,927, dated Sep. 26, 1978, Ser. No. 786,613, Apr. 11, 1977. Continuation-in-part of Ser. No. 610,071, Sep. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,003, Oct. 11, 1974, abandoned. Application for reissue Sep. 24, 1980, Ser. No. 190,934

Int. Cl.³ F26B *3/08*

U.S. Cl. 34—1 **47 Claims**



35. A process for controllably transporting a flowable bed containing magnetizable particles within a vessel, said bed being expanded and levitated within said vessel by a fluid stream, wherein the superficial fluid velocity of said fluid stream ranges between:

(1) more than the normal fluidization superficial fluid velocity required to expand and levitate said bed in the absence of said applied magnetic field; and

(2) less than the superficial fluid velocity required to cause time-varying fluctuations of pressure difference through said expanded and levitated bed over a finite period of time during continuous operation in the presence of said applied magnetic field, said process comprising the steps:

(a) subjecting at least a portion of said bed to an applied magnetic field having a substantial component along the direction of a force field external to said bed; and

(b) controllably transporting said bed within said vessel in response to a pressure differential in said bed.

Re. 31,440

ELECTROCHEMICAL ELECTRODE WITH HEATING MEANS

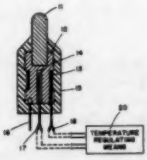
Patrick Eberhard, Allschwil, Switzerland; Konrad Hammacher, Tübingen, Fed. Rep. of Germany, and Wolfgang Mindt, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Original No. 3,795,239, dated Mar. 5, 1974, Ser. No. 177,231, Sep. 2, 1971. Application for reissue Jan. 18, 1978, Ser. No. 870,392

Claims priority, application Switzerland, Oct. 1, 1970, 14544/70

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—635 **8 Claims**



1. An electrode arrangement for application to a body surface for bloodless measurement in connection with the concentration or the partial pressure of a gas in the blood [including] *comprising*, sensor means for *electrochemically* deriving, in vivo, electrical signals indicative of the *concentration or* partial pressure of gas in *the* blood [and having] *, said sensor means including* a face member [adapted] for body contact[, the improvement comprising:]*; and* heating means in direct thermal contact with [said sensor means and adapted to transmit to said face member a thermal condition for thermal stimulation at the applied body surface of local blood circulation] *the face member for transmitting heat throughout the face member into the body tissue directly therebeneath to produce a condition of sufficient hyperemia in said body tissue.*

Re. 31,441

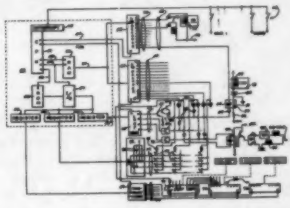
PLAYER OPERATED GAME APPARATUS

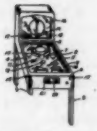
David J. Nutting, and Jeffrey E. Frederiksen, both of Milwaukee, Wis., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Original No. 4,093,232, dated Jun. 6, 1978, Ser. No. 576,980, May 13, 1975. Application for reissue Aug. 25, 1978, Ser. No. 936,784

Int. Cl.³ A63F *7/00*

U.S. Cl. 273—121 A **95 Claims**





61. A game apparatus comprising:

a processor having program means for programming the processor and memory means for storing signals;

a physical mass capable of motion, said mass being a surface projectile;

a game surface for supporting the surface projectile;

player-operated control means for affecting the motion of the physical mass;

a plurality of response means for detecting the mass, each response means having signaling means associated therewith and operatively connected to the processor for signaling the processor that the response means has detected the mass;

a plurality of display means for presenting information based upon the detection of the mass by the response means, each display means having a display activation means associated therewith and operatively connected to the processor for activating the display means in response to a signal from the processor; and

multiplexing means operatively connected to the processor for cyclicly and sequentially enabling each of the signaling means to signal the processor that its associated response means has detected the mass, and for cyclicly and

sequentially enabling each of the display activation means to activate its associated display means;

said processor having means for storing the signals from the signaling means enabled by the multiplexing means into the memory means, and for addressing the program means and the memory means, and for signaling the display activation means enabled by the multiplexing means, in response to the program means and the memory means.

Re. 31,442

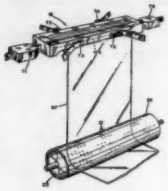
METHOD AND APPARATUS FOR MANUFACTURE OF GLASS FILM

Lawrence V. Pfaender, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Original No. 4,268,296, dated May 19, 1981, Ser. No. 99,457, Dec. 3, 1979. Application for reissue Sep. 15, 1981, Ser. No. 302,332

Int. Cl.³ C03B *5/02, 17/06*

U.S. Cl. 65—90 **6 Claims**



1. An apparatus for drawing glass film of a thickness less than 0.003 inch, comprising a block of hot glass-resistant material, means mounting said block in underlying relationship to a pool of molten glass, said block defining an elongated slot like orifice having a width in the range of 0.10 inch to 0.40 inch through which a film of glass may be continuously drawn, the walls of said orifice being electrically conductive, a plurality of electrical junctions connected to spaced areas of said walls, and power means for flowing electric current through said junctions and said orifice walls to maintain the lateral end portions of said orifice walls at a lower temperature than the central portions, thereby maintaining both edge areas of the drawn film at a lower temperature than the center area.

5. A method of controlling the temperature of a thin film of glass drawn from a slot-like metallic walled orifice, the orifice having a width of exceeding 0.40 inches, comprising the steps of passing separate electrical currents through the central portions of the orifice walls and through each of the lateral end portions of the orifice walls, and controlling said electrical currents to produce a temperature differential of the cental portions of the orifice walls in excess of the temperature of the lateral end walls of the orifice, and drawing a film of glass of a final thickness not in excess of 0.003 inches through said orifice.

Re. 31,443

TREATMENT OF SILICA

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 4,297,460, dated Oct. 27, 1981, Ser. No. 173,525, Jul. 30, 1980. Division of Ser. No. 44,809, Jun. 1, 1979, Pat. No. 4,248,735, which is a continuation-in-part of Ser. No. 857,552, Dec. 5, 1977, abandoned. Application for reissue May 3, 1982, Ser. No. 374,114

Int. Cl.³ C08F *4/02, 4/24, 4/78*

U.S. Cl. 526—98 **24 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-containing support at an elevated temperature to a treating ambient selected from (1) [carbon monoxide, (2)] a halogen-containing component selected from bromine, iodine, HBr, HI, organic bromides, and organic iodides, which halogen-containing component also either contains air or is followed by air or [(3)] (2) a carbon, oxygen and sulfur-containing composition, thereafter incorporating a chromium compound under anhydrous conditions to thus form said catalyst and thereafter activating said catalyst in an oxygen ambient.

24. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-titania cogel support at an elevated temperature to a treating ambient comprising carbon monoxide, thereafter incorporating a chromium compound under anhydrous conditions to thus form said catalyst and thereafter activating said catalyst in an oxygen ambient.

25. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-containing support at an elevated temperature to a treating ambient comprising carbon monoxide to produce a treated support, thereafter preoxidizing said treated support by subjecting said treated support to oxidation conditions, thereafter incorporating a chromium compound under anhydrous conditions to form said catalyst and thereafter activating said catalyst in an oxygen ambient.

Re. 31,444

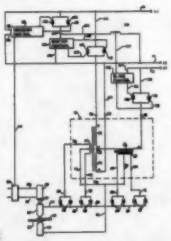
TWO-PHASE TRANSFORMER AND WELDING CIRCUIT THEREFOR

Merrill Block, 1736 Woodward, SE., Grand Rapids, Mich. 49506

Original No. 4,169,975, dated Oct. 2, 1979, Ser. No. 813,787, Jul. 8, 1977. Application for reissue Oct. 31, 1980, Ser. No. 202,733

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—116 **14 Claims**



1. In a welding apparatus having Scott-connected transformers, three primary input terminals which are adapted to be connected to a three-phase power supply and four secondary output leads with which are connected to a first electrode through wafer diode assemblies, the transformer further having a center tap output lead from each of the secondary coils, which center tap output lead is connected to a second welding electrode, whereby a DC circuit is made through the first and second electrodes, the improvement comprising:

all of the four secondary output leads formed in a relatively flat configuration with top and bottom surfaces of greater extent than other surfaces of said leads, at least the top surfaces of each of said output leads lie entirely in a common plane;

deformable leads formed of multiple laminated straps of conductive material connected between each of the output leads and the diodes for firmly supporting the diodes;

a common conductor plate member of relatively flat configuration having a surface of greatest extent lying entirely in a plane parallel to the common plane of the output leads; and

means clamping the diode assemblies under pressure between the common conductor plate and the deformable leads so that the leads deformably respond to any variation in thickness of the diodes as the diodes are secured in place so that equal pressure can be applied to each diode.

PLANT PATENTS

GRANTED NOVEMBER 15, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,137

PLUM TREE

John M. Garabedian, 3104 E. Huntington Blvd., Fresno, Calif. 93702

Filed Aug. 18, 1981, Ser. No. 294,038
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described and being characterized by its early maturity, approximately one week to ten days earlier than the Red Beaut variety; by fruit which is slightly more oblate and compressed in shape than fruit of the Nubiana variety, has a more attractive dark maroon color when ripe than the Nubiana, a distinctive and alluring aroma, and a richer, more vinuous flavor than fruit of the Nubiana, and has a fruit stone which is characterized by its non-uniformity in size and shape, its irregular periphery, and its irregularly furrowed surface.

5,138

APRICOT TREE (SPRING GIANT)

C. Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Apr. 7, 1982, Ser. No. 366,158
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree of large size, vigorous upright growth and a regular and productive bearer of very large, firm yellow flesh, freestone fruit with excellent eating quality and the ability to ship to long distance markets; the apricot tree is further characterized when compared to the Flaming Gold Apricot Tree (U.S. Plant Pat. No. 2,822) as having a more uniform distribution of fruit within the center of the tree and a more uniform ripening of the fruit throughout the tree.

5,139

PEACH TREE

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Inc., Del Rey, Calif.

Filed Nov. 23, 1981, Ser. No. 324,257
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by quite vigorous growth producing freestone fruit of very large size, having a bright red to a bright yellow color, a tough skin, very firm flesh of bright yellow color having very good flavor and aroma and a pit cavity bounded by a very slight rim of red; and ripening about the twentieth of July.

5,140

PEACH TREE 'AUGUST SUN'

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Inc., Del Rey, Calif.

Filed Nov. 23, 1981, Ser. No. 324,256
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by its freestone fruit of dark red color having very crisp bright yellow flesh with a bright red ring bounding the pit cavity and with a skin which is tenacious to the flesh ripening August 18 to August 24.

PATENTS

GRANTED NOV. 15, 1983

ERRATA

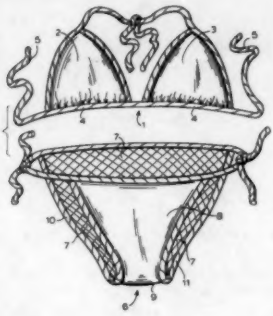
For CLASS	See PATENT NO.
128–325	4,414,721
244–028	4,415,124
366–165	4,415,275
434–113	4,415,326
434–249	4,415,327
502–117	4,415,474
502–206	4,415,475
502–224	4,415,476
502–178	4,415,477
502–181	4,415,478
502–185	4,415,479
502–242	4,415,480
502–062	4,415,481
502–205	4,415,482
502–255	4,415,483
502–332	4,415,484
502–100	4,415,485
525–054	4,415,490
381–045	4,415,767
381–010	4,415,768
369–060	4,415,772
382–027	4,415,880
378–058	4,415,980

PATENTS

GRANTED NOVEMBER 15, 1983

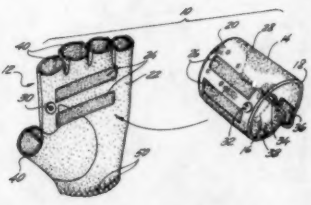
GENERAL AND MECHANICAL

4,414,691
REVERSIBLE BATHING GARMENT
Jose Estruch, San Juan, P.R., assignor to Fabrilmalla, Inc., Guaynabo, P.R.
Filed Jun. 3, 1982, Ser. No. 384,479
Int. Cl.³ A41D *5/00*; A41B *9/00*
U.S. Cl. 2—67 **3 Claims**



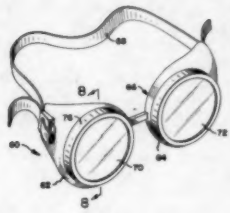
1. A reversible bathing garment for wear by a human person which comprises;
a single, unseamed cloth having a first planar surface and a second planar surface, said surfaces being mutually bounded by a single, peripheral edge;
said cloth having been cut to a size and configuration whereby it will, when worn by said person, cover private parts of the person;
a binding tape secured to the entirety of the peripheral edge; and means attached to the binding tape for supporting the cloth on the body of said person.

4,414,692
DRINKING GLOVE
Mark A. Dzierson, and William V. Dzierson, Sr., both of Johnstown, N.Y., assignors to Elmer Little & Sons, Inc., Johnstown, N.Y.
Filed Jun. 7, 1982, Ser. No. 385,806
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—160 **2 Claims**



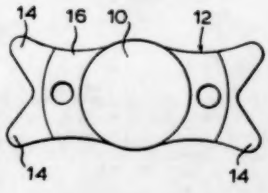
1. A drinking glove for facilitating handling of a drinking vessel comprising:
a glove portion adapted to fit about a hand;
a pocket portion defining a volume dimensioned to receive a drinking vessel, said pocket portion comprising a generally cylindrical member including a generally cylindrical side wall and a substantially continuous bottom wall, said cylindrical member being open at the top for defining an opening in said pocket portion for accommodating insertion and removal of said drinking vessel;
means for releasably securing said pocket portion to said glove portion;
means for retaining the upper end of said pocket portion in close confronting relation with the palm of said glove portion; and
means for adjusting the volume enclosed by said pocket portion comprising a generally axial longitudinally extending slit in said side wall, and means for releasably joining the portions of said side wall on either side of said slit and for adjusting the extent of overlap between said portions when joined.

4,414,693
OPTICAL DEVICES FOR USE IN MOISTURE LADEN ATMOSPHERE
Samuel S. Brody, 5 Saxony Rd., Pittsford, N.Y. 14534
Filed May 4, 1981, Ser. No. 260,643
Int. Cl.³ A61F *9/02*
U.S. Cl. 2—435 **13 Claims**



11. In goggles having a frame and a lens which define the sealed region with the face of the wearer thereof, an opening in said frame, and a membrane consisting of hydrophylic perfluorosulfonic acid polymer for fogging prevention on said frame sealing said opening.

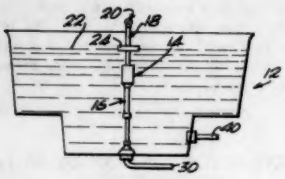
4,414,694
INTRA-OCULAR LENSES
David P. Choyce, 9 Drake Rd., Westcliff on Sea, England
Continuation-in-part of Ser. No. 287,628, Jul. 28, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 435,106
Claims priority, application United Kingdom, Aug. 5, 1980, 8025426; May 11, 1981, 8114325
Int. Cl.³ A61F *1/16*
U.S. Cl. 3—13 **3 Claims**



1. An intra-ocular lens which is formed entirely of a polysulfone plastics material which is capable of being worked to produce a lens of optical quality, which has a refractive index

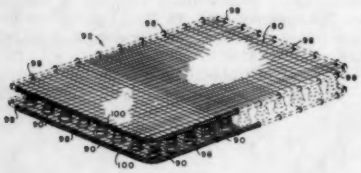
in excess of 1.55 and which is capable of being autoclaved in steam at a temperature in excess of 110° C.

4,414,695
HYDROJET
James F. Hart, 2012 NE. 17th Terr., Fort Lauderdale, Fla. 33305
Filed Aug. 24, 1981, Ser. No. 295,605
Int. Cl.³ A61H 33/02; B01F 3/04
U.S. Cl. 4—542 11 Claims



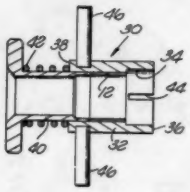
1. In combination with a spa, tub or swimming pool defining a receptacle for water, and a pump for recirculating water into and out of said receptacle, the improvement which comprises:
a jet head consisting of:
an inner member having a central inlet for receiving water from said pump and a plurality of outwardly facing discharge passageways to each discharge a jet of water into the receptacle;
an outer member extending around said inner member defining an annular chamber, said outer member having an orifice axially aligned with each discharge passageway;
an air inlet tube in fluid communication with said chamber at one end of said tube and a source of air at the other end of said tube;
and means for supporting and radially repositioning said jet head from a central position in the receptacle.

4,414,696
MATTRESS WITH NON-WOVEN FABRIC COVERED SPRINGS
Edward W. Weitzel, Greenville, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Division of Ser. No. 218,736, Dec. 22, 1980. This application Jul. 21, 1982, Ser. No. 400,564
Int. Cl.³ A47C 23/32, 23/04
U.S. Cl. 5—475 1 Claim



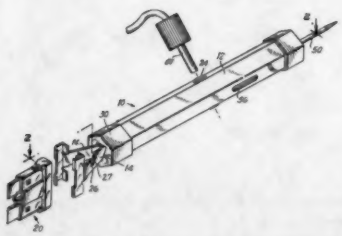
1. A mattress comprising: a plurality of springs, a non-woven fabric covering both sides of said springs, a filling mat on both sides of each of said non-woven fabrics and a mattress ticking covering the filling mats to form a mattress cover, said non-woven fabric having a plurality of fill yarns extending lengthwise of said mattress and a plurality of warp yarns extending across the width of said mattress substantially perpendicular to said fill yarns and located above and below said fill yarns with the warp yarns above the fill yarn being mated with a warp yarn below said fill yarns, the warp having an end count in the center of said mattress at least twice the end count at the extremities of said mattress.

4,414,697
TOOL FOR FIBER OPTIC CABLE CLAMP
James T. Hartley, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Oct. 5, 1981, Ser. No. 308,774
Int. Cl.³ B25F 1/00; B23P 19/04; B21F 3/00
U.S. Cl. 7—107 8 Claims



1. A tool for a fiber optic cable strength member clamp comprising:
a cylinder having a forward end and a rear end, said cylinder being adapted to slidably receive therein a crimp sleeve for said clamp having a predetermined length;
a plunger slidably mounted into the rear end of said cylinder having a forward end adapted to engage one end surface of the sleeve for ejecting the sleeve outwardly through said forward end of said cylinder, said plunger normally being in a retracted position;
an axially extending open slot in said cylinder opening at its forward end, said slot being dimensioned to receive a cable strength member therein;
said forward end of said plunger when in its retracted position being spaced behind the inner end of said slot a distance at least as great as said predetermined length; and
means for rotating said cylinder around its longitudinal axis for helically winding a cable strength member extending outwardly through said slot.

4,414,698
AUTOMBILE FUSE PULLER AND COMBINATION CIRCUIT TESTER
Harry Epstein, Seaford, N.Y., assignor to Kastar, Inc., Bellport, N.Y.
Continuation of Ser. No. 123,928, Feb. 25, 1980, Pat. No. 4,314,383. This application Nov. 17, 1981, Ser. No. 322,254
Int. Cl.³ B25F 1/00; B25B 27/14
U.S. Cl. 7—170 7 Claims



1. An improved fuse pulling apparatus comprising an elongated housing; a pair of complementary jaws slidably mounted within said housing and extending partially outwardly thereof, means for urging the jaws towards one another as the jaws are

moved into the housing including a stationary plate having a substantially rectangular opening through which said pair of jaws are disposed, means for urging the jaws to rotate as the jaws are moved into the housing, and means for locking the jaws in a closed position such that forward movement without manual rotation of the device would cause the jaws to lock onto a fuse, said means for locking the jaws in a closed position includes at least one notch in each said jaw of a thickness slightly greater than that of said plate whereby each of said jaws may be disposed onto the edge of said plate when said notches are brought into adjacent position therewith.

4,414,699

MECHANICAL SWEEPER FOR ATTACHMENT TO A CARRIER VEHICLE

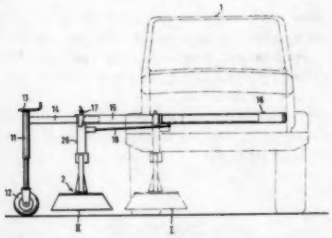
Max Hirt, Waldshut, Fed. Rep. of Germany, assignor to Ing. Alfred Schmidt GmbH, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,369

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, 3034741

Int. Cl.³ E01H *1/04*

U.S. Cl. 15—87 **9 Claims**



1. Mechanical sweeper comprising a sweeping assembly arranged on a carrier vehicle having front and rear wheels, said sweeping assembly being attached as a single unit to and hence movable with a carrier frame, guide means for movably attaching said carrier frame to the vehicle, said carrier frame being movably attached to the carrier vehicle by said guide means for shifting the sweeping assembly into an inoperative position outside the lateral profile outline of the vehicle to facilitate servicing or removal of said sweeping assembly.

4,414,700

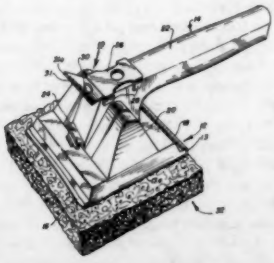
DEVICE FOR PREPARING A SURFACE FOR PAINTING

Fredrick B. Burns, S. Milwaukee, Wis., assignor to EZ Paintr Corporation, Milwaukee, Wis.

Filed Aug. 24, 1981, Ser. No. 295,659

Int. Cl.³ A47L *13/12*

U.S. Cl. 15—105 **5 Claims**



1. A device for preparing a surface for coating and removing paint or similar material, comprising:

a base having attachment means,

a handle secured to said base,

a pad removably connected to said base of said attachment means, said pad including a first abrasive material for removing said paint or similar material and a second liquid absorbing material for dispensing liquid onto said surface from which said paint or similar material is to be removed, and

a rigid scraper secured to said handle including means for attaching a material removing device thereto.

4,414,701

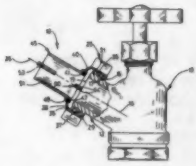
DEVICE FOR CLEANING A HOSE COUPLING

Douglas J. Johnson, 4455 N. Dickenson Ave., Fresno, Calif. 93711

Filed Jul. 19, 1982, Ser. No. 399,423

Int. Cl.³ B08B *9/02*; B23G *5/00*

U.S. Cl. 15—105 **5 Claims**



1. A device for cleaning a coupling, the coupling having a surface circumscribing a predetermined axis of the coupling and a face disposed in a predetermined relation to the axis and the device comprising a first element having a surface conforming to the surface of the coupling and circumscribing a predetermined axis of the device, said surface defining a cleaning edge disposed to engage said surface of the coupling in cleaning relation when the surface of the element is disposed at the surface of the coupling and said axes are disposed in substantially coincident relation and the first element is rotated about said axes relative to the coupling; a second element defining a cleaning edge conforming to the face of the coupling; and means for mounting the second element on the first element for rotation relative thereto about the predetermined axis of the device with the cleaning edge of the second element disposed to engage the face of the coupling in cleaning relation when the second element is rotated about said axis relative to the first element, when said surface of the first element is disposed at said surface of the coupling, and when said axes are disposed in substantially coincident relation.

4,414,702

CASTOR LOCKING DEVICE FOR ARRESTING THE ROTATION AND THE SWIVELLING OF THE CASTOR

Manfred Neumann, Radevormwald, Fed. Rep. of Germany, assignor to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Compagnie, Wermelskirchen, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,854

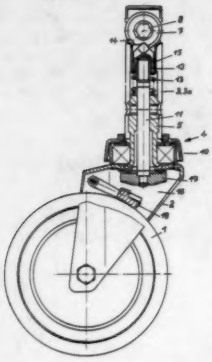
Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119649

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—35 R **5 Claims**

1. In a castor having a locking device to arrest rotation of its wheel and/or swivelling of its fork, the improvement wherein the device comprises a mounting sleeve, an axially movable and rotatable locking pin extending through the mounting sleeve and through its fork head, said locking pin having an axial screw thread at its top portion and a vertically adjustable, non-rotatable top member threadedly mounted thereon, a cam disposed in the mounting sleeve and acting on the top member,

means connected to the locking pin for rotating the locking pin relative to the mounting sleeve wherein the mounting sleeve has means guiding the top member for axial movement while



preventing corotation with the locking pin, whereby the top member can be moved vertically and adjusted vertically by way of the screw thread by rotation of the locking pin relative to the mounting sleeve.

4,414,703

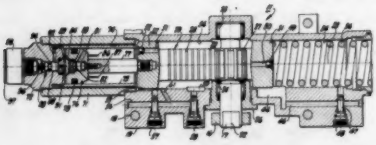
DOOR CLOSER AND HOLDER

Raymond H. Schnarr, and Richard L. Zunkel, both of Princeton, Ill., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Sep. 1, 1981, Ser. No. 298,477

Int. Cl.³ E05F *3/12, 3/20*

U.S. Cl. 16—52 **4 Claims**



1. A door closer and holder comprising a housing having a central chamber and a closing cylinder communicating with each other, a closing piston reciprocable in said closing cylinder, a sleeve extending said closing cylinder, a plunger reciprocable in said sleeve, means for connecting said plunger and said closing piston for movement together, a plug engaging said sleeve, said plug having a compound bore, a metering disc in said plug and opening into said compound bore and the interior of said closing cylinder, an auxiliary plunger reciprocable in said compound bore between a closed position in abutment with said metering disc and an open position out of abutment with said metering disc, an armature stem axially movable in said compound bore and disposed with one end in abutment with said auxiliary plunger, an armature disc fast on the other end of said armature stem, a solenoid coil surrounding said armature stem, and means mounting said solenoid coil on said plug for axial movement toward and away from said armature disc.

4,414,704

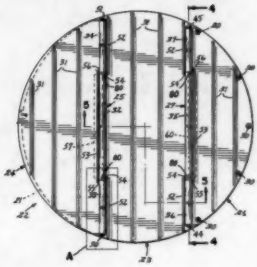
HINGE FOR CONTAINER COVER

Edward J. Reuter, Excelsior, Minn., assignor to Reuter, Inc., Hopkins, Minn.

Division of Ser. No. 19,771, Mar. 12, 1979, Pat. No. 4,213,539. This application May 23, 1980, Ser. No. 152,708

Int. Cl.³ E05D *9/00*

U.S. Cl. 16—223 **7 Claims**



1. In a hinge a section having a raised central tongue projecting beyond a pair of lateral portions which extend in alignment with said raised central tongue on opposite sides thereof;

dams extending along and spaced inward from the edges of said lateral portions;

and lateral extensions connecting the ends of said dams proximate said raised central tongue with the ends of said raised central tongue.

4,414,705

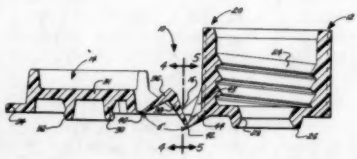
OVERCENTER HINGE

Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Richmond, Va.

Filed Jul. 17, 1981, Ser. No. 284,489

Int. Cl.³ E05D *1/02;* B65D *51/04*

U.S. Cl. 16—225 **10 Claims**



1. A thermoplastic biasing spring integrally formed with first and second plate members, said plate members being hingedly connected one to the other along a first hinge line, said plate members being pivotably moveable about said first hinge line from a first position to a second position, and said second plate member having a rigid post longitudinally displaced from said first hinge line, said biasing spring comprising: a first arm and a second arm resiliently connected at one of their ends and said first arm being hingedly connected at its other end to said first plate member to form a second hinge line and said second arm being hingedly connected at its other end to the furtherest extent of said rigid post to form a third hinge line, said third hinge line being longitudinally displaced from said first hinge line whereby pivoting movement of one or both of said plate members about said first hinge line from one of said positions to the other said positions causes said second hinge line to move closer to said third hinge line thereby placing said biasing spring in compression, said compression urging said plate members to one of said positions dependent upon the location

of said second hinge line with respect to said first hinge line as said plate members accomplish said pivoting movement.

4,414,706

FRICTION STAY WITH RESILIENT COUPLING FOR WINDOWS

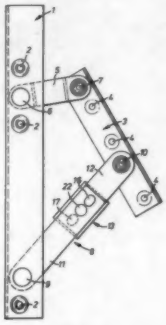
Jack E. Douglas, Walsall, England, assignor to Arthur Shaw Manufacturing Company, Willenhall, England

Filed Sep. 8, 1981, Ser. No. 300,395

Claims priority, application United Kingdom, Sep. 23, 1980, 8030702

Int. Cl.³ E05D *15/32*

U.S. Cl. 16—370 8 Claims



1. In a friction window stay for pivotally mounting a sash on a frame, said stay comprises arms pivotally connected to respective sash and window frame mounting plates by friction pivot joints so as to permit restrained pivotal movement of said arms relative to said mounting plates; one of said stay arms comprises two links connected together by a resilient coupling for compression under load applied longitudinally of said one stay arm to store energy and to apply such stored energy to said one stay arm on resilient restoration, said resilient coupling comprising a connector locating said links co-axially for relative movement with at least one resilient element acting between said connector and said links.

4,414,707

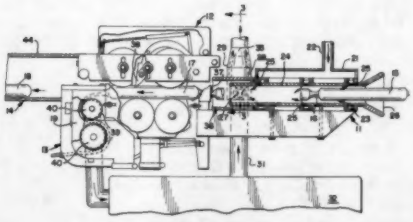
SAUSAGE CASING REMOVAL APPARATUS

Ernest E. Koken, Madison, Wis., assignor to Oscar Mayer & Co., Inc., Madison, Wis.

Filed Jun. 30, 1981, Ser. No. 278,986

Int. Cl.³ A22C *11/00*

U.S. Cl. 17—1 F 11 Claims



1. In a sausage casing removal apparatus comprising a sausage trackway and means for conveying sausages along the trackway, the trackway having a plurality of operational stations including (a) a conditioning assembly having a product loading horn having means for contacting the casing of the sausage with conditioning fluid while the sausage is conveyed along the trackway, (b) means for longitudinally slitting the conditioned casing, and (c) means for removing the slit casing from the sausages, said slit casing removing means being downstream of said conditioning assembly, the improvement comprising:

the conditioning assembly having venturi means for impelling the conditioning fluid through the product loading horn at a velocity greater than that velocity at which the conditioning fluid is supplied to the conditioning assembly; and

the venturi means including a plurality of restricted passageways through the product loading horn of the conditioning assembly, fluid directing means overlies the restricted passageways along a peripheral area of the conditioning assembly, and the restricted passageways have a total cross-sectional area less than the peripheral area of the fluid directing means.

4,414,708

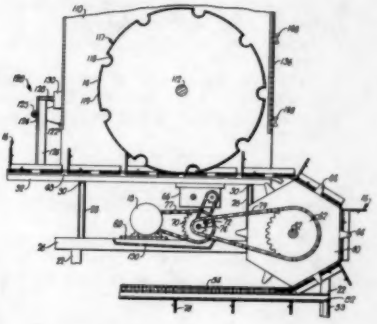
AUTOMATIC LIVESTOCK HEAD SPLITTER

Phillip J. Sauvago, Denison, Iowa, assignor to Farmland Foods, Inc., Kansas City, Mo.

Filed Apr. 7, 1982, Ser. No. 366,160

Int. Cl.³ A22B *5/20*

U.S. Cl. 17—1 R 15 Claims



1. An apparatus for splitting the heads of livestock comprising:

frame means;

a circular blade rotatably carried by said frame means and having a peripheral cutting edge including structure defining a plurality of circumferentially spaced apart notches intersecting said cutting edge to present a plurality of circumferentially spaced apart relieved zones at said periphery with portions of said cutting edge between respective relieved zones;

a plurality of means moveably supported by said frame means for carrying said livestock heads;

power means operably connected to said head supporting means for drawing said head supporting means seriatim into a cutting position for cutting of said carried heads by said blade; and

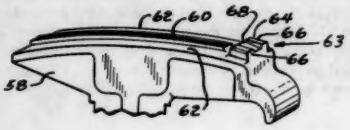
means operably connecting said power means, head-supporting means and blade, for movement of said head-supporting means respectively into said cutting position, and for rotation of said blade in synchronism with said movement of said head supporting means in order that said portions of said blade edge split corresponding carried heads and a relieved zone on said blade prevents excess cutting of said carried head and damage to selected internal portions of said head.

4,414,709

SHRIMP PROCESSING MACHINE HAVING IMPROVED CUTTING STRUCTURE

E. Douglas Betts, Libertyville, Ill., assignor to Gregor Jonsson Associates, Inc., Highland Park, Ill.

Filed Aug. 26, 1981, Ser. No. 296,573
Int. Cl.³ A22C 29/02
U.S. Cl. 17—71 11 Claims



1. A shrimp processing machine comprising:

a plurality of processing stations including a cutting station having a rotary blade means for cutting the shrimp lengthwise, and carrier means for gripping the shrimp and transferring the shrimp seriatim through said processing stations,

said carrier means including a plurality of clamp sets for gripping the tail and body of a shrimp, each body clamp having a pair of spaced clamp arms defining an elongated space therebetween, a shrimp support member disposed contiguous to said elongated space for coacting with said clamp arms for gripping the shrimp,

said support member including a first pedestal having a groove therein,

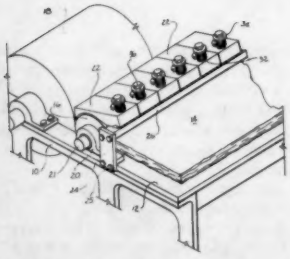
said groove being aligned with said cutting blade for allowing said rotary blade means to enter said groove for cutting entirely through a shrimp disposed on said support member.

4,414,710

TEXTILE CARDING MACHINE FEED ASSEMBLY AND METHOD

George F. Bolen, 107 Rockwood Dr., Greenville, S.C. 29605

Continuation-in-part of Ser. No. 959,227, Nov. 9, 1978, abandoned. This application Aug. 14, 1981, Ser. No. 292,932
Int. Cl.³ D01G 15/40
U.S. Cl. 19—105 3 Claims



1. Apparatus for feeding a lap of fibers to a carding machine of the type which includes a feed roll which feeds fibers to a licker-in roll and a feed plate over which a layer of said fibers are conveyed to the feed roll, said apparatus comprising:

a plurality of individual segmented presser means carried adjacent said feed roll; and

means mounting said presser means to be individually movable towards and away from said feed roll;

said individual segmented presser means being arranged generally side-by-side continuously without interruption across the entire length of said feed roll for applying an even uniform pressure segmentally to segments of the lap of fibers continuously across the width of the lap for retaining control of fibers at the nip of said rolls should a fiber lump raise one of the presser means above the other presser means; and

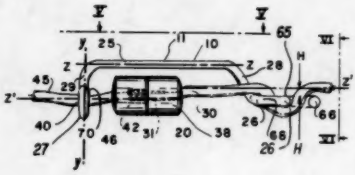
biasing means urging said presser means individually toward said feed roll exerting an even pressure against said lap of fibers along said feed roll regardless of the thickness of said layer of fibers.

4,414,711

SECURITY CORD HOLDER

Merle H. Hubbard, 222 W. 2nd, P.O. Drawer YY, Cortez, Colo. 81321

Filed Aug. 27, 1981, Ser. No. 296,889
Int. Cl.³ F16G 11/14
U.S. Cl. 24—129 C 10 Claims



1. A retainer unit for mounting about two spaced apart sections of an electrical cord unit so as to prevent separation of a connector assembly between and detachably joining said sections and adaptable to alternatively retain a coil of said cord between two cord sections comprising

a shaped unitary resilient rod formed at a first end section with

an eye section shaped with opening means so as to enable a first section of an entire electrical cord to be readily inserted into an opening in the center of said eye section through said opening means, and formed at the second end section with fastening means,

said fastening means shaped to detachably engage or alternatively be disengaged about a second section of an electrical cord, together with

an intermediate section of the retainer unit that joins said first end section to said second end section, said intermediate section shaped to extend at a distance from a longitudinal axis joining said first end section to said second end section so as to clear an object such as a cord connector assembly located between said first end section and said second end section of the unit, the longitudinal axis of said fastening means being located within a substantially horizontal plane and the longitudinal axis of said eye section extending along a substantially vertical plane with respect to the longitudinal axis of said fastening means.

4,414,712

LINE FASTENING DEVICE

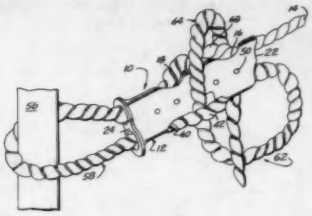
Paul T. Beggins, The Keel, East Islip, N.Y. 11730

Filed Feb. 10, 1982, Ser. No. 347,670
Int. Cl.³ F16G 11/00; B63B 21/00
U.S. Cl. 24—129 R 16 Claims

1. A line fastening device for forming an eye in a line, comprising:

an elongated body having first and second longitudinal ends with first and second passageways extending through the body between the ends and openings at the ends for passing line through each passageway, wherein the elongated body has a first lateral opening in the body extending into the first passageway allowing line within the passageway to depart the passageway, and two adjacent second and

third lateral openings in the body extending into the second passageway for passing a line out of the second passageway through the second lateral opening and back into



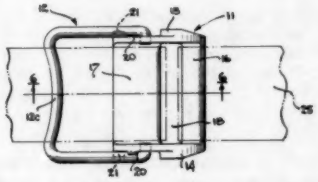
the second passageway through the third lateral opening, a body portion between the second and third lateral openings holding a line passing thereover out of the second passageway.

4,414,713

QUICK-RELEASE STRAP BUCKLE

Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Oct. 2, 1981, Ser. No. 308,428
Int. Cl.³ A44B *11/00*
U.S. Cl. 24—193 **5 Claims**



1. A quick-release buckle for joining strap together comprising

(1) a main body portion including

(a) a pair of oppositely positioned side walls

(b) first and second spaced apart cross arms running between said side walls,

(c) a slot being formed between said cross arms,

(d) a detent formed along the upper portion of the outer surface of at least one of said side walls, and

(e) a stop member formed below said detent on the other surfaces of said at least one of said side walls,

(f) an aperture formed in the outer surface of each of said side walls; and

(2) a handle of an elastic material including

(a) a pair of side arms,

(b) a cross arm joining one of the ends of said side arms together,

(c) the other of the ends of the side arms having turned-in end portions, said turned-in end portions being fitted in the apertures formed on the side walls of the main body portion such that the side arms extend partially along the outside of the main body portion;

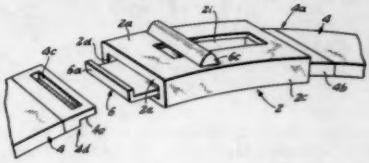
the handle being movable from an "open" to a "closed" position, during which movement at least one of the side arms of the handle rides over the detent and slightly springs the turned-in end portion thereof out of its associated aperture, said at least one of said side arms finally snapping into a retained position between the detent and the stop member.

4,414,714

EXPANSIBLE CLASP AND MODULE FOR WATCH STRAPS

Andrew T. Kostanecki, Darien, Conn., and George Mileos, Riverdale, N.Y., assignors to Timex Corporation, Waterbury, Conn.

Division of Ser. No. 106,815, Dec. 26, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,757
Int. Cl.³ A44C *5/18, 11/02*
U.S. Cl. 24—265 WS **3 Claims**



1. An expansible clasp for connecting the free ends of an elongated strap together, comprising:

(a) a housing elongated in the long direction of said strap, the housing having top and bottom walls connected together by spaced lateral side walls and having spaced ends transversed to the snap length, one of said ends defining an excess opening into the housing and an abutment wall and the other end being connected to one of the free strap ends, said top housing wall having a slot therethrough elongated along the strap length,

(b) an elongated sliding member disposed in the housing and adapted to slide into and out of the housing through said access opening for expansion purposes, said sliding member having means at the outer end adjacent said access opening for releasably connecting to the other free strap end and having at its opposite inner end an upturned shoulder extending through the elongated slot in the top wall of said housing with portions of said shoulder inside said housing forming an abutment wall in spaced, facing relation to the abutment wall of said housing end and portions terminating outside the housing forming a finger tab by which the sliding member can be manually slid out of the housing by the wearer to effect releasable engagement between the outer end of said sliding member and said other free strap end, and (c) spring means positioned in the housing between the spaced, facing abutment walls of said sliding member and housing end, the spring means being biased so as to urge the sliding member into the housing while permitting extension thereof out of said housing for expansion and engagement purposes.

4,414,715

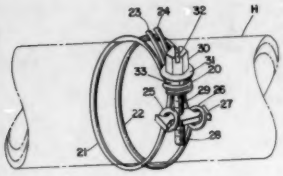
WIRE GRIP HOSE CLAMP

Theodore R. Anjos, Shrewsbury; Robert F. Fay, York, both of Pa.; Robert H. Sebald, Baltimore, Md., and Henry T. Van Egmond, Grosse Pointe Woods, Mich., assignors to Murray Corporation, Cockeysville, Md.

Filed Apr. 8, 1981, Ser. No. 252,064
Int. Cl.³ A43C *11/08;* **A44B** *13/00*
U.S. Cl. 24—283 **4 Claims**

1. In a wire loop hose clamp having a screw adapted to be tightened by a driving tool having a rotatable socket engageable with said screw, said clamp comprising a length of wire formed to provide a spiral grip loop and a pair of spaced hose-gripping circular portions which terminate in free ends disposed between said portions and extending substantially tangentially to said portions and tending to abut and exert disengaging pressure upon said socket when said socket is engaged with said screw, a nut interconnecting said hose-gripping portions, said screw having a stem extending through said spiral grip loop into threaded engagement with said nut, said screw having a head of polygonal configuration provided with an

annular base flange abutting and interposed between said free ends whereby said free ends are maintained in a spaced-apart relationship, said base flange being of substantially larger diameter than the distance between diametrically opposite corners



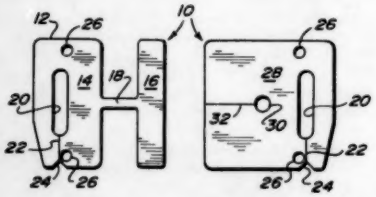
of said head, and said diameter preferably being at least equal to the outside diameter of said socket, whereby said flange isolates said socket from said free ends and said disengaging pressure of said free ends is transferred from said socket to said flange.

4,414,716

GARMENT CLASPING DEVICE

Frank Stastney, 2nd & Dotts Sts., Apt. D-210, Pennsburg, Pa. 18073

Filed Oct. 5, 1981, Ser. No. 308,398
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—3 L **2 Claims**



1. A clasping device for releasably securing small articles of clothing together for washing, storing or the like comprising:

(a) at least one flat, resilient H-shaped member, one leg of said H having at least one generally eliptical aperture therein and a divisionary cut extending from an edge of said member to said aperture, and said other leg providing the male fitting for

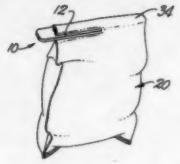
(b) a second, flat, resilient member having a generally eliptical aperture therein and a divisionary cut extending from an edge of said member to said aperture, said second member also including a second generally circular aperture and a second divisionary cut extending from an edge of said member to said second aperture, said second aperture providing the female fitting having said male member removably received therein, whereby said first and second members provide separable removably coupled garment claspers when a garment section is slipped within and along said cut by flexing said member at its cut edge and thereafter said garment is held by said member's rebounding.

4,414,717

CLOSURE CLIP FOR SNACK FOOD BAGS AND THE LIKE

David W. Payne, 7801 Juniper, Prairie Village, Kans. 66208

Filed Aug. 12, 1981, Ser. No. 292,233
Int. Cl.³ B65D *77/10, 33/16*
U.S. Cl. 24—30.5 R **21 Claims**



1. A clip for fastening closed a bag or the like comprising:

a unitary, multi-slotted body having at least three elongated, juxtaposed, at least generally equally spaced apart members including at least one long member and a short member which is longitudinally fixed in position relative to the other members, said short member being approximately 40% to 70% of the length of said long member; and

means integrally interconnecting said members adjacent a common end thereof, the ends of said members remote from said interconnecting means being free,

the ratio of the length of said long member to the width of said clip at its widest point being not less than about 3 to 1,

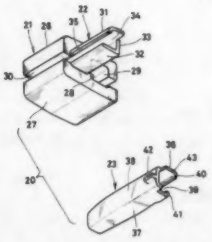
said members cooperating to define a pair of elongated, bag-receiving slots therebetween, each of which has substantially parallel, non-diverging lateral extremities throughout the length thereof for properly confining respective portions of a bag when attached thereto.

4,414,718

SEPARABLE SLIDE FASTENER

Isamu Kumano, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 3, 1982, Ser. No. 374,318
Claims priority, application Japan, May 7, 1981, 56-65137[U]
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—396 **4 Claims**



1. A separable slide fastener, comprising:

(a) a pair of stringer tapes each carrying on its one longitudinal edge a row of continuous coupling elements of thermoplastic synthetic resin, each said coupling element having a coupling head, a pair of spaced legs extending from said coupling head in a common direction, and a connector extending from one of said legs to one leg of an adjacent coupling element;

(b) sewing stitches securing said rows of coupling elements to the respective stringer tapes; and

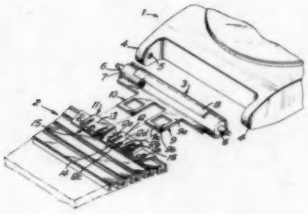
(c) a separable terminal assembly comprising a box and a box pin extending therefrom mounted on one of said stringer tapes at one end thereof, and a separable pin mounted on the other stringer tape at one end thereof and engageable with said box,

(d) said connectors of the endmost coupling elements located adjacent to said pins being fused with the respective stringer tapes, said pins each having a pair of opposite plates disposed one on each side of the respective stringer tapes, one of said plates extending beyond the other plate to overlie each said fused endmost connector, said other plate terminating short of the fused endmost connector.

4,414,719
WRISTWATCH ATTACHMENT WITH INTERCHANGEABLE END PIECES

David F. Capolupo, Oakville, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 22, 1982, Ser. No. 360,142
Int. Cl.[3] A44C *5/14*
U.S. Cl. 24—265 WS 2 Claims



1. An improved intermediate end piece for connecting a watchband to a watchcase having spaced lugs adapted to accommodate a conventional spring bar, said improvement comprising:

a retainer clip attached to the watchband having a first plate portion spaced from the watchband and defining at least one longitudinal passage therebetween,

an end piece member having a tubular section adapted to receive the spring bar and also having at least one longitudinal tongue adapted to slide into said passage, said tongue including a second plate portion enclosed between the first plate portion and the watchband;

at least one of said plate portions having an integral resilient tab defined therein biased toward the other plate portion, said resilient tab including a notch in the end thereof in order to facilitate entry of a tool for springing the tab to release the end piece, and

said other plate portion defining a notched out area arranged to receive said tab when said tongue is inserted in the passage and defining a transverse section preventing easy removal of the tongue due to interference with the tab.

4,414,720
CRANIAL CLOSURE

Clarence Crooms, 19144 Coyle, Detroit, Mich. 48235

Filed Jul. 22, 1982, Ser. No. 400,809
Int. Cl.[3] A01N *1/00*
U.S. Cl. 27—21 2 Claims

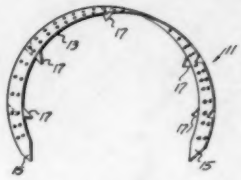
1. A cranial closure comprising an elongated flexible metallic strip having a pair of opposing side edges and formed into U-shape between its ends;

a plurality of longitudinally spaced opposed pairs of tapered tines projecting from said side edges and extending radially inward at right angles to said strip along its length and upon opposite sides thereof;

and a pair of laterally spaced rows of longitudinally spaced skin retaining spikes struck from said strip and extending radially inward thereof parallel to said tines;

said strip adapted to overlie, span and extend along an incision of the cranium resulting from embalming, creating opposed registering skin sections of the scalp adjacent said incision and including sub tissue;

the spikes retainingly extending through opposed registering



portions of said skin sectins holding them substantially drawn together to close said incision, said tines retainingly projecting through adjacent skin sections and adjacent sub tissue for anchoring said strip upon said cranium;

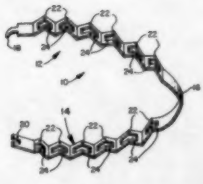
said strip being arcuate for substantial cooperative registry with the cranium, said tines and spikes being pointed;

said tines being longer than said spikes with the respective ends extending radially outward thereof.

4,414,721
OCCLUSIVE CLIP AND APPLICATOR FOR CONSTRICTING FLEXIBLE TUBULAR MEMBERS

Charles A. Hufnagel, 4900 Massachusetts Ave., NW., Washington, D.C. 20016

Filed Nov. 7, 1980, Ser. No. 204,831
Int. Cl.[3] A61B *17/12, 17/00*
U.S. Cl. 128—325 16 Claims



1. An occlusive clip configured to be compressed about and constrict a flexible tubular member, comprising a pair of opposed strip-like clamping legs hingedly interconnected at one end and adapted to receive a tubular member therebetween, the opposed inner surfaces of said legs being corrugated to present undulating surfaces of crests and valleys extending generally transversely of the length of said legs with the crests and valleys of one leg being prearranged with respect to the crests and valleys of the other leg, and at least one slot means in each of said legs for providing a relief area for the material of the compressed tubular member to stabilize the clip and prevent migration thereof.

4,414,722

METHOD FOR THE MANUFACTURE OF ELECTRICAL COMPONENTS ESPECIALLY LAYER CAPACITORS

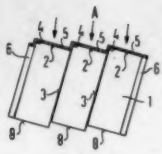
Ulrich Wehnelt, Söcking, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,223

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021786

Int. Cl.³ H01G 4/32

U.S. Cl. 29—25.42 2 Claims



1. Method for the manufacture of layer capacitors with dielectric layers of glow polymerisate, which comprises sawing apart an unmetallized electrically insulating tape having smooth surfaces to form a plurality of separate strip-shaped carriers with smooth surfaces and relatively rough separating surfaces formed by the sawing operation, placing a plurality of the carriers against each other in such manner that their separating surfaces formed by the sawing are exposed, offsetting the carriers relative to each other perpendicularly to the separating surfaces to expose edges of the smooth surfaces of the carriers maintaining the plurality of carriers in the positions achieved by said placing and offsetting operations, while said plurality of carriers are so maintained, coating the two opposite surfaces of the carriers resulting from said separation from the tape and also the exposed edges of the carriers by applying contact layers of a metal which will not soften during later contacting of the metal, and subsequently metallizing a smooth unmetallized surface of each carrier by applying a metal layer thereto which overlaps at least one of the contact layers and forms with the latter an electrically conducting connection.

4,414,723

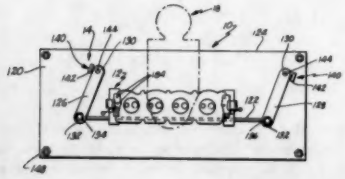
ADJUSTABLE CYLINDER HEAD HOLDER

James A. Kammeraad, Holland, Mich., and Ronald L. Tiger, Joplin, Mo., assignors to K-Line Industries, Inc., Holland, Mich.

Division of Ser. No. 94,453, Nov. 15, 1979, abandoned. This application Jun. 11, 1981, Ser. No. 272,715

Int. Cl.³ B23Q 3/04

U.S. Cl. 29—26 A 9 Claims



1. An apparatus for supporting a cylinder head in position beneath a drill press during boring of the head valve guides, the drill press including a vertical post and a head, said apparatus comprising:

a base plate positionable below the drill press head;

a pair of transversely spaced, opposed cylinder head stand means for supporting a cylinder head, each of said stand means including means for permitting rotational and means for permitting angular positional adjustment of the cylinder head in a single vertical plane about two perpendicularly related axes; and

positioning means on said plate and supporting said pair of stand means for permitting selective positioning of said pair of stand means to valve guide boring positions beneath the drill press head, said pair of stand means being laterally shiftable on said base plate by said positioning means to permit alignment of each valve guide of the cylinder head with the drill press.

4,414,724

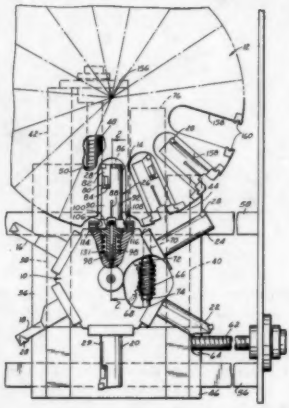
TOOL CHANGING MECHANISM

Donald W. Garnett, Grand Ledge, Mich., assignor to The Olofsson Corporation, Lansing, Mich.

Filed Jun. 24, 1981, Ser. No. 276,806

Int. Cl.³ B23B 29/24

U.S. Cl. 29—39 21 Claims



1. Apparatus for holding a tool on the turret of a machine such as a boring or turning machine comprising spaced tool retaining means on said turret, spreading means on said turret between said retaining means and shiftable between advanced and retracted positions, a tool bar slotted at one end to provide a pair of legs and disposed in a position such that its legs are between said retaining means and adjacent to said spreading means, and means for shifting said spreading means to its advanced position to engage and spread said legs into engagement with said retaining means.

4,414,725

METHOD FOR TURBOCHARGER REPAIR

Steve Breitweiser, 744 N. 2nd Ave., Villa Park, Ill. 60181, and David Nelson, 210 N. Broadway, Park Ridge, Ill. 60068

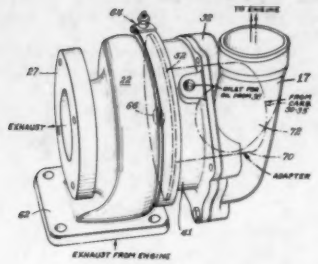
Continuation-in-part of Ser. No. 28,072, Apr. 9, 1979, abandoned. This application Feb. 4, 1981, Ser. No. 231,401

Int. Cl.³ F02B 37/00

U.S. Cl. 29—156.4 R 3 Claims

1. The method for repairing a failed engine turbocharger having a turbine section, a compressor chamber section connected into the fuel/air engine intake conduit and a turbine/compressor cartridge, which comprises the steps of temporarily converting the engine to a naturally aspirated engine by first removing the cartridge from the turbocharger leaving said turbine section open to the atmosphere and the fuel/air engine intake conduit open to the atmosphere, then closing the opening thereby left in the turbine section by fastening a plate over

said opening and providing connection means completing the fuel/air conduit to the engine, and thereafter removing the plate and the connection means and installing an operative cartridge to complete the repair of the turbocharger.

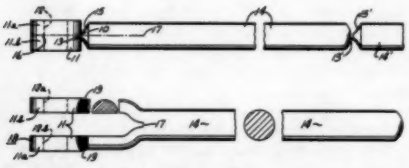


4,414,726

METHOD OF MANUFACTURING CLEVIS END CONNECTING ROD

Roland E. Cale, Jr., 732 Lakeview Ave., Cortland, Ohio 44410

Filed Jul. 16, 1981, Ser. No. 283,945
Int. Cl.³ B23P *15/00*; B23K *31/00*
U.S. Cl. 29—156.5 A **9 Claims**



1. A method of manufacturing a metal rod connecting member having at least one bifurcated clevis end with aligned transverse bores to receive a connecting or clevis pin therethrough, comprising the steps of positioning an outside side surface of a metal eye member having a bore therethrough against one end of a metal rod with the bore running transverse to said rod, circumferentially welding said one rod end to said eye member side surface, thereafter transversely cutting said eye member in half to provide a gap therebetween in line with the axis of said rod, then axially cutting said one end of said rod to a predetermined depth to provide a bifurcated rod end and a bifurcation gap aligned with said gap between said eye member halves, and then spreading and re-shaping said bifurcated rod end to form a clevis end with the bores of said eye member halves in spaced alignment to receive a clevis pin.

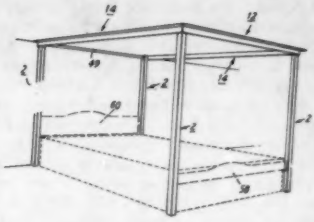
4,414,727

KIT FOR CONVERTING A BED INTO A FOUR-POSTER

Ronald Steele, Cramlington, England, assignor to Development & Finance Limited, The Isle of Man, Isle of Man

Filed Nov. 18, 1981, Ser. No. 322,427
Claims priority, application United Kingdom, Nov. 24, 1980, 8037634
Int. Cl.³ B23P *7/00*; A61J *19/00*; A61F *9/00*
U.S. Cl. 29—401.1 **7 Claims**

1. A kit of parts for converting a bed in a bedroom into a four-poster, the kit of parts comprising at least three pelmets for securing to the ceiling of the bedroom, one to extend substantially above and the length of each side of the bed and one to extend substantially above and across the bottom end of the bed, four corner posts, one for each corner of the bed and each of a length just less than the height of the bedroom, and four brackets each including a first portion for securing relative to the ceiling of the bedroom substantially above a corner of the bed, a second portion pivotal relative to said first portion and adapted to receive thereon the upper end of an associated corner post, and resilient means reacting between said bracket and the upper end of the associated corner post to urge the lower end of said post towards the floor of the bedroom.

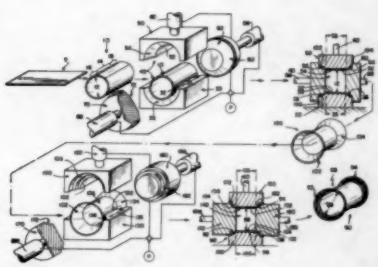


4,414,728

WHEEL RIM APPARATUS AND METHOD

Charles R. Ford, and Stephen L. Gatsos, both of Indianapolis, Ind., assignors to Indus Wheel Company, Cincinnati, Ohio

Continuation of Ser. No. 61,829, Jul. 30, 1979, abandoned. This application May 20, 1981, Ser. No. 265,668
Int. Cl.³ B21H *1/10*; B21K *1/38*
U.S. Cl. 29—159.1 **13 Claims**



1. A method of forming a wheel rim from a wheel rim blank having a well center region separating axially spaced wheel bead seat regions, the well center region of the blank having a finished diameter, consisting of a first step of simultaneously confining the well center region of the blank to maintain the finished diameter thereof and flaring the bead seat regions of the blank on each side of the well center region, and a second step of simultaneously confining the well center region of the blank to maintain the finished diameter thereof and final fashioning the flared bead seat regions to form a bead seat on each side of the well center region.

4,414,729

TOOL AND METHOD FOR CROWNING TEETH

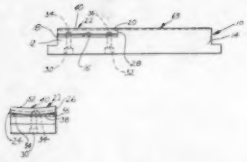
Robert R. Ridley, Pontiac, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 1, 1981, Ser. No. 268,971
Int. Cl.³ B21D *17/02*, *53/28*; B23P *13/00*, *15/14*
U.S. Cl. 29—159.2 **3 Claims**

1. A tool for pressure forming teeth on a cold rolled cylindrical member comprising a tooth forming rack having a tooth forming working surface having a leading edge and a trailing edge, said tooth forming rack including an undercut surface on the trailing end thereof having an insert supporting surface extending in spaced apart non-intersecting relation with the

tooth forming working surface, an insert supported on said undercut surface including side edges thereon with an insert working surface therebetween and having a plurality of preformed teeth extending in length toward the side edges on the working surface of the insert each having pre-formed straight ground tips, and means on said insert for deforming the preformed teeth on the working surface of the insert into a concave shape for producing a continuous concave curvature along the length of the teeth of the insert from one of said side edges to the other including intermediate insert portions therebetween such that said deforming means exerts a force on the insert in a transverse plane substantially normal to said undercut surface so that as the leading edge of the rack passes with respect to a part to be cold rolled by the tool the concave curvature of the teeth will form a predetermined true curvature crown on each tooth rolled on the cold rolled part.

3. An improved method for cold forming transversely directed uniform cross-section teeth along the length of a cylindrical part with a tooth forming rack including the steps of



pre-forming an insert to have a flat working surface thereon, grinding pressure forming teeth across the working surface by a grinding wheel following a straight line with respect to the depth of the working surface of the insert, providing the trailing end of a tooth forming rack having a tooth forming working surface with an undercut support surface extending in spaced apart non-intersecting relation with the tooth forming working surface, locating the insert at said trailing end of the tooth forming rack on said undercut support surface thereof and shaping the working surface of the insert by exerting a force on said insert in a direction substantially normal to the undercut support surface to cause the teeth to have a uniform concave curvature transversely along the length of the teeth thereof from one side to the opposite side of the insert and intermediate insert portions therebetween and moving the rack insert relative to the outer surface of a cylindrical cold rolled part with the axis of the part substantially parallel with the length of the teeth to produce a resultant uniformly crowned tooth on the cold rolled part along the length of each pressure formed tooth formed by the working teeth of the insert.

4,414,730

METHOD FOR PROCESSING PAPER SHEETS OF BANDED PAPER SHEET BUNDLES AND A PROCESSING MACHINE THEREFOR

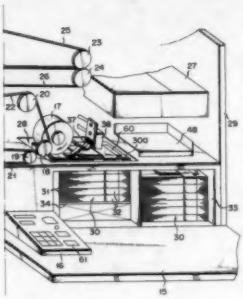
Hideo Ohmura, and Shigeo Horino, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 18, 1981, Ser. No. 303,491

Claims priority, application Japan, Sep. 22, 1980, 55-132141; Oct. 2, 1980, 55-137910; Oct. 13, 1980, 55-142735

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—426.3 **25 Claims**



1. A method for processing paper sheets of paper sheet bundles each tied up with a band including steps of successively locating banded paper sheer bundles in layers in a setting section and removing the paper sheets of each located bundle from said setting section, the improvement which comprises steps of:

(a) attaching a to-be-detected medium bearing common detection information to each said bundle;

(b) disposing a detecting means over said setting section so as to detect the to-be-detected medium attached to the bundle which has reached said setting section;

(c) removing the band from the bundle located in said setting section;

(d) storing the removed band in a storing section; and

(e) removing the paper sheets one by one from the bundle having its band removed according to step (c); and

(f) detecting the to-be-detected medium attached to the next successive bundle by said detecting means after all the paper sheets of the bundle located in said setting section have been removed according to step (e) to once stop the delivery of the paper sheets.

4,414,731

METHOD OF MANUFACTURE OF RAISED RELIEF ILLUMINATED GLOBE

Wolfgang J. Riemer, Chicago, Ill., assignor to Replogle Globes, Inc., Chicago, Ill.

Division of Ser. No. 135,538, Mar. 31, 1980, Pat. No. 4,300,887. This application Jun. 4, 1981, Ser. No. 270,494

Int. Cl.³ B29D *9/00;* **B29C** *17/04, 27/00*

U.S. Cl. 29—453 **6 Claims**

1. A method for forming at least a portion of a globe in relief, comprising, in combination:

a. imprinting a flexible, plastic sheet with a predetermined two-dimensional printed pattern;

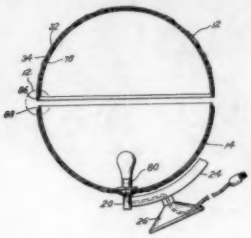
b. stretch-forming said sheet into a generally concave, flexible curved form, said form having an outer surface and an inner surface;

c. positioning the stretch-formed sheet in a mold cavity, having a generally concave surface conforming generally to the form of said sheet and including relief areas, with

the outer surface of said sheet in opposed relation to mold surfaces defining said cavity;

d. subsequently orienting printed areas of said stretch-formed sheet with respect to corresponding said relief areas;

e. positioning a mold core in spaced relation to the inner surface;



f. subsequently injecting a hardenable material intermediate said inner surface and the mold core and forcing the stretch-formed sheet to deform permanently into the relief areas of the mold defining said mold cavity by pressure of the injection material on the inner surface; and

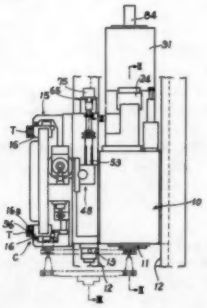
g. hardening said hardenable material to maintain the sheet in a form having relief areas conforming with the mold cavity pattern with said printed pattern substantially in register with said relief areas.

4,414,732

MACHINE TOOL WITH AUTOMATIC TOOL CHANGE FUNCTION

Tamaki Tomita, Okazaki; Yoshikazu Sano, Kariya, and Kunimichi Nakashima, Anjo, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 2, 1981, Ser. No. 250,101
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **13 Claims**



1. In a machine tool with an automatic tool change function having a tool spindle rotatably supported and capable of receiving a tool at one end thereof, the improvement comprising:

a key fixedly mounted on one end of said tool spindle;

a key-way formed on said tool;

tool support means for rotatably supporting at least one tool to selectively insert and remove said at least one tool into and from said tool spindle;

control means responsive to a tool change command for rotating said tool spindle at a predetermined speed suitable for the engagement of said key with said key-way;

operating means for causing relative movement between said tool support means and said tool spindle in an axial direction of said tool spindle for a tool change operation with said tool spindle being rotated at the predetermined speed;

stopping means for stopping said relative movement between said tool support means and said tool spindle at a predetermined position in the axial direction of said tool spindle before said key comes into engagement with said key-way;

first detecting means for detecting a first predetermined angular position of said key relative to said key-way to thereby generate a first signal; and

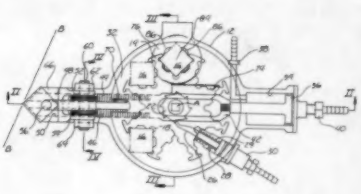
releasing means responsive to said first signal for permitting said relative movement between said tool support means and said tool spindle.

4,414,733

MACHINE TOOL INSERT DISPENSER

Adam M. Janotik, Grosse Ile, and Lawrence P. Kazyak, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 21, 1981, Ser. No. 265,744
Int. Cl.³ B23Q *3/155*
U.S. Cl. 29—568 **8 Claims**



1. A dispenser for supplying cutting tool inserts each insert having multiple cutting edges for use in machining comprising:

a magazine mounted for rotation about an axis, adapted to carry a plurality of inserts at spaced locations, the cutting edges occupying fixed positions with respect to reference positions;

a rack mounted for reciprocating movement;

a first piston reciprocating within a cylinder and connected to the rack;

clamping means drivably engaged with the rack, rotatable as the rack moves, adapted to grip and hold an insert carried on the magazine, to remove an insert from the magazine and to return the insert to the magazine as the piston moves;

a second piston within a cylinder;

a surface adapted to rotate about an axis, movable into contact with an insert carried on the magazine whereby the insert is transferred from the magazine onto the surface as the second piston moves;

means for rotating the insert with respect to its reference position while the insert is supported on the surface so that another cutting edge of the insert is brought into alignment with the reference position;

means for transferring the insert from the support surface onto the magazine;

a gear wheel fixed to the third piston drivably engaged with the rack and adapted to rotate the surface as the first piston moves; and

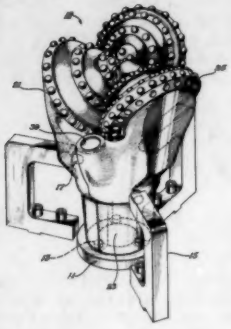
means for incrementally advancing the position of the magazine with respect to the clamping means whereby each insert is sequentially removed from the magazine.

4,414,734

TRIAD FOR ROCK BIT ASSEMBLY

Gerald O. Atkinson, Pasadena, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Nov. 30, 1981, Ser. No. 326,083
Int. Cl.[3] B23K *31/00*, *37/04*; B23Q *3/18*
U.S. Cl. 29—464 5 Claims



1. A method of positioning bit sections for welding, each section having faces intersecting each other at 120 degrees to provide a centerline, comprising:

providing a hole in each bit section at the centerline; and

providing a locking member having three pins joined together at a common point;

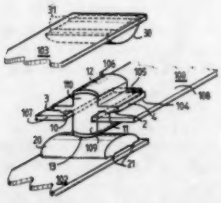
inserting each pin of the locking member into one of the holes and clamping the sections together.

4,414,735

PROCESS FOR MAKING CONDUCTOR ELEMENT WITH DOUBLE CONTACT FACE

Raymond Buisson, Chabeuil, France, assignor to Crouzet, Paris, France

Filed Apr. 16, 1981, Ser. No. 254,852
Claims priority, application France, Apr. 16, 1980, 80 08506
Int. Cl.[3] H01R *43/02*
U.S. Cl. 29—879 6 Claims



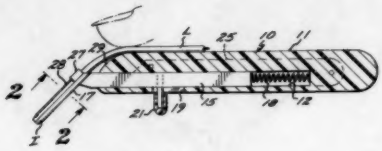
1. A process for making a conductor element having a movable conductor blade and a double contact carried by the blade, which comprises cutting out a multimetallic portion from a prefabricated section, said portion having a pair of contacts thereon; cutting out a notch in one end of said blade; introducing said portion into said notch, whereby said portion extends away from opposite sides of said blade; abutting said portion against the edges of said notch; and securing said portion to said blade with said contacts on either side of said blade.

4,414,736

INSERTION AND EXTRACTION TOOL FOR CONNECTOR TERMINALS

Russell F. Fieberg, Westminster, and Donald E. Fieberg, Sunset Beach, both of Calif., assignors to Russtech Engineering Company, Inc., Huntington Beach, Calif.

Filed Nov. 23, 1981, Ser. No. 324,155
Int. Cl.[3] H01R *43/00*
U.S. Cl. 29—747 1 Claim



1. A tool for inserting and withdrawing electrical leads in the body of a multiple lead connector comprising:

an elongate handle of substantially rectangular form provided with a longitudinal groove in one lateral surface thereof, said groove communicating through one end of said handle and terminating in an urging surface proximate the other end of said handle, said handle including an arcuate opposing surface formed on one edge thereof proximate said one end and a slot transversely extending through the other edge into the interior of said groove;

a substantially rectangular slide received in said groove for longitudinal translation therein, said slide including an end extension projecting through said one end of said handle and having an arcuate seat at the end thereof;

a helical spring received between said slide and said urging surface of said groove for urging said slide to extend outwardly from said one end of said handle;

a post attached to said slide and aligned to extend through said slot for manual articulation of said slide along a longitudinal motion segment determined by the width of said slot;

an elongate plate attached to said handle in alignment over said groove for retaining said slide in the interior thereof, said plate including an end projection extending along said slide beyond said one end of said handle and having an arcuate end segment aligned in opposition to said seat;

a first and second tubular section respectively fixed to said arcuate end segment and to said arcuate seat to extend in cantelever therefrom, said first and second sections cooperating to form a tubular structure conformed to retain said electrical leads when opposed relative each other and to release said leads when separated, said tubular sections being aligned to guide said leads over said arcuate opposing surface to be compressed thereat by the fingers of a user of said tool; and

detent means connected to said slide for fixing the sliding extension thereof in said opposing and separated alignments.

4,414,737

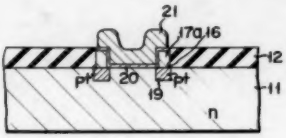
PRODUCTION OF SCHOTTKY BARRIER DIODE

Atsuhiko Menjo, and Shinji Saitoh, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,588
Claims priority, application Japan, Jan. 30, 1981, 56-12742; Jan. 30, 1981, 56-12768; Jan. 30, 1981, 56-12769
Int. Cl.[3] H01L *21/225*
U.S. Cl. 29—578 9 Claims

1. A method of manufacturing a Schottky barrier diode comprising:

forming an insulating layer on the surface of a semiconductor substrate of a first conductivity type;
forming a first opening in said insulating layer, partly exposing the surface of said substrate;
forming a continuous semiconductor layer doped with an impurity of a second conductivity type opposite to said first conductivity type over said insulating layer and on said exposed substrate surface in said first opening;
etching said doped semiconductor layer in the direction of thickness thereof until those portions which lie on the insulating layer and the exposed surface of the substrate



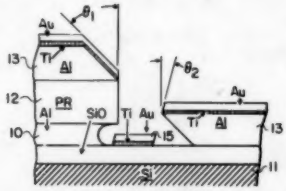
are removed to provide as a diffusion source a portion of said doped semiconductor layer remaining on the side wall of said insulating layer which defines said first opening and also form a second opening partly exposing said semiconductor substrate surface within said first opening;
causing diffusion of said impurity from said diffusion source into said semiconductor substrate to form a guard ring region therein; and
forming a metal layer on said exposed semiconductor substrate surface within said second opening, said metal layer forming a Schottky barrier with said semiconductor substrate.

4,414,738

OPTICAL LITHOGRAPHIC TECHNIQUE FOR FABRICATING SUBMICRON-SIZED JOSEPHSON MICROBRIDGES

Edward C. Jelks; George L. Kerber, and Howard A. Wilcox, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,246
Int. Cl.³ H01L *39/22*
U.S. Cl. 29—579 **10 Claims**



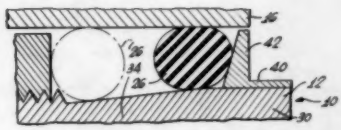
1. A method of fabricating planar, Josephson microbridge devices and arrays of microbridge devices each microbridge device having a bridge dimensioned with a length and width each less than 0.3 micrometer and which extends between a first superconducting electrode and a second superconducting electrode all of which are disposed on a planar substrate, comprising:
depositing a first layer of a metal on the substrate;
disposing a first photoresist layer on top of at least a portion of the deposited first metal layer;
etching the first deposited metal layer to undercut the photoresist layer;
depositing a second metal layer on the substrate to define a submicron wide exposed substrate strip next to and beneath the photoresist layer, the depositing of the second metal layer is at a first acute angle to the normal of the substrate over the upper edge of the photoresist layer to define the dimensions of the exposed substrate strip;
depositing the microbridge material on the exposed substrate strip to produce the submicron-sized microbridge, the depositing of the microbridge material is at a second acute angle to the normal of the substrate over the upper edge of the second deposited metal layer and under a lower exposed edge of the photoresist layer to define the lateral dimensions of the submicron-sized microbridge;
dissolving the photoresist layer; and
stripping away the first and second metal layers of the substrate to leave the submicron-sized bridge on the substrate, the submicron-sized bridge is included in a microbridge device by depositing the first and second superconducting electrodes along the submicron-sized microbridge to assure the creation of a submicron gap between the electrodes.

4,414,739

APPARATUS FOR HYDRAULICALLY FORMING JOINTS BETWEEN TUBES AND TUBE SHEETS

John W. Kelly, Burbank, Calif., assignor to Haskel, Incorporated, Burbank, Calif.

Filed Dec. 19, 1980, Ser. No. 218,431
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—727 **18 Claims**



1. A swaging apparatus for expanding a tube disposed within a tube sheet to form a joint, said apparatus comprising:
a mandrel body for insertion in said tube;
inner and outer seal members carried by said body at axially spaced-apart locations to define a volume between said body and said tube bounded at opposite ends by said seal;
a ramp defined by said body and tapered radially inwardly toward said inner seal member, said ramp being adapted to permit said outer seal member to move therealong toward said inner seal member, thereby allowing said outer seal member to slide along said tube with reduced frictional forces as said mandrel body is inserted; and
means for urging said outer seal member to move axially toward said inner seal member as said mandrel body is inserted in said tube.

4,414,740

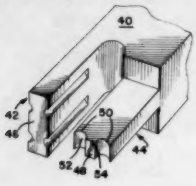
INSULATION-PIERCE AND CRIMP TERMINATION TOOL

John P. Nijman, Scarborough, Canada, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 42,465, May 25, 1979, Pat. No. 4,264,118, which is a continuation of Ser. No. 897,076, Apr. 17, 1978. This application Nov. 6, 1980, Ser. No. 204,612
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—751 **1 Claim**

1. A tool for terminating an insulated conductor in an insulation-piercing terminal portion of an electrical contact, said terminal portion being disposed within a connector insert cavity and including an elongated channel having side walls and a bottom wall with an upwardly extending insulation-piercing means, said tool comprising:
a bifurcated termination head including an insertion member and a crimping member, said insertion member having a generally planar end face for engaging a longitudinal

portion of said conductor and for properly positioning said conductor and terminal portion within said cavity for a subsequent crimping operation, and said crimping member having an end face including means for cutting portions of said side walls at a location coincident with said



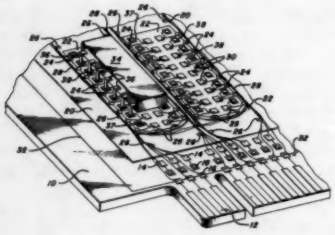
insulation-piercing means and means for folding said side wall portions onto said conductor to mechanically retain said conductor in insulation-piercing and electrical engagement with said contact terminal portion, said insertion member and said crimping member operating simultaneously on adjacent contacts in the same connector.

4,414,741

PROCESS FOR INTERCONNECTING COMPONENTS ON A PCB

Richard C. Holt, Fairhaven, Mass., assignor to Augat Inc., Mansfield, Mass.

Filed May 22, 1981, Ser. No. 266,620
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—837 **8 Claims**



1. A process for installing and interconnecting components on a printed circuit board comprising:

interconnecting terminal pads on a single printed circuit board side with a network of wires routed in groups around selected upwardly projecting removable guide pins along pathways which exclude portions of the printed circuit board apertured to receive electrical leads from printed circuit board components;

removing said removable guide pins;

covering the network of interconnection wiring thus formed with a layer of material to adhere them to the circuit board;

installing electrical components on said circuit board on the same side as the covered network of interconnecting wires with the electrical leads therefrom protruding the circuit board apertures to the opposite side thereof;

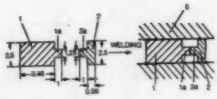
applying an electrical interconnection medium to the side of said circuit board opposite to the one having said network of wires to provide electrical connection of the leads from said components to said terminal pads through said apertures.

4,414,742

METHOD OF MAKING COMPOSITE ELECTRICAL CONTACT

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Tokyo, Japan

Filed Nov. 21, 1980, Ser. No. 208,827
Claims priority, application Japan, Nov. 22, 1979, 54-150665
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—882 **4 Claims**



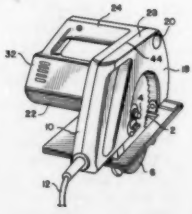
1. A method of making a composite electrical contact from a plurality of cut wires, including wires of different materials, by cold welding: which comprises providing at least one end of one of said wires of a first material with at least one projection which is smaller in diameter than the diameter of said one end of said one wire, locating said one end of said one wire and said projection within a die cavity having a diameter which corresponds to the diameter of said one end of said one wire, and with said projection abutting one end of another wire of a second material, and subjecting said wires to force along their axial directions to expand the projection outwardly over the abutting surfaces and thereby binding said surfaces together along an interface lying in a plane extending transversely of the axes of said wires.

4,414,743

CIRCULAR SAW

Peter P. Pioch, Idstein, and Annette Schober, Niederams, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

Filed Dec. 10, 1981, Ser. No. 329,218
Claims priority, application United Kingdom, Dec. 11, 1980, 8039712
Int. Cl.³ B26D *7/06*
U.S. Cl. 30—124 **14 Claims**



1. A portable circular saw or the like comprising:

a saw-blade compartment for accommodating a circular saw-blade;

a motor compartment secured to the saw-blade compartment and projecting transversely therefrom;

a motor in the motor compartment for driving the saw-blade;

a rear handle extending rearwardly from the saw-blade compartment;

a forward handle connected to the saw-blade compartment and projecting transversely therefrom on the same side thereof as said motor compartment;

said saw blade compartment, said motor compartment, said rear handle and said forward handle being formed from three separate housing parts;

the first of said housing parts forming one side of said rear handle, and a portion of said saw-blade compartment;

the second of said housing parts forming the other side of said rear handle, a portion of said motor compartment, another portion of said saw-blade compartment, and a portion of said forward handle, said first and second housing parts abutting each other; and

the third of said housing parts forming the remainder of said motor compartment, the remainder of said forward handle, and the remainder of said saw-blade compartment, said third and first housing parts abutting each other, and said third housing part abutting said second housing part along a plane transverse to the plane of rotation of the circular saw-blade.

4,414,744

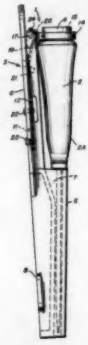
KNIFE AND SHEATH

Walter W. Collins, Clover, S.C., assignor to Schur, Inc., Framingham, Mass.

Filed Jul. 29, 1981, Ser. No. 287,916

Int. Cl.³ B26B *29/02*

U.S. Cl. 30—151 **3 Claims**



1. In combination a knife having a handle terminating in a projecting pommel and a blade, a sheath having a blade engaging portion and a hanger integral therewith, said hanger adapted to lie adjacent to said knife handle when the knife blade is inserted in said blade engaging portion, and lock means comprising a pommel engaging member, means pivotally supporting said pommel engaging member on said hanger and spring means selectively spring loading said pommel engaging member in either nonlocking or locking engagement with said pommel;

wherein said means pivotally supporting said pommel engaging member includes a hinge supported in part by said hanger, and a dog integrally formed on said pommel engaging member adapted to be engaged by said spring;

wherein said pommel engaging member comprises a rigid ring shaped to conform with and engage the periphery of said pommel and supported by said hinge for pivotal movement between a locking position in which the diameters of the ring are in a plane normal to the length of the knife when positioned in the sheath to a nonlocking position in which the diameters of the ring are in a plane substantially parallel to the length of the knife;

wherein said dog extends normally from the plane containing the diameters of said ring;

wherein said spring means comprises a leaf spring with one end secured to said hanger and the other engageable with said dog when said pommel engaging member is in nonlocking position; and

wherein said pommel engaging member further includes a slot extending parallel to the axis of said hinge and sized to permit said other end of said spring to project therethrough on movement of said pommel engaging member to said locking position.

4,414,745

GUIDING ARRANGEMENT FOR A HAND TOOL

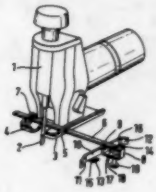
Gerhard Kuhlmann, Stuttgart, and Erwin Wolf, Weissach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 298,164

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 8024714

Int. Cl.³ B23D *51/04*

U.S. Cl. 30—373 **6 Claims**



1. A guide arrangement for a hand saw with a blade having teeth with tips, comprising a tool support; a guide element connectable to said support; a guide rail secured to said element and adapted to abut an edge of a workpiece when a straight parallel cut is produced; said guide element having a strip-like shape and formed with a loop-like end portion rigidly connected to said guide rail, said guide rail extending normal to the elongation of said guide element and including two projections extending parallel to said guide element and provided with two openings, respectively; and a centering pin threadedly releasably insertable in one of said openings selectively, said centering pin having such a length that when it is inserted into one of said openings it projects past said guide element towards the surface of the workpiece to enable the tool to produce a circular cut, said two openings being equally spaced from said strip-like guide element by a distance which corresponds to the distance between the tips of the teeth of the saw blade and said strip-like guide element along a line parallel to the guide rail.

4,414,746

LINEAR SCALE TYPE MEASURING INSTRUMENT

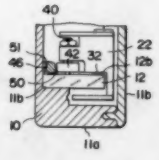
Kinji Takizawa, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,920

Claims priority, application Japan, Feb. 27, 1980, 55-24766[U]

Int. Cl.³ G01B *7/02, 11/02*

U.S. Cl. 33—125 C **5 Claims**



1. A linear scale type measuring instrument comprising a hollow case, a linear scale housed in said hollow case, a slider

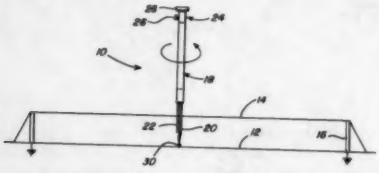
movable on said linear scale and an index scale fixed to said slider facing to a graduated surface of said linear scale, characterized in that at least part of a travel guide mechanism of said slider includes at least two bearings rotatably supported on said slider and a guide bar, being circular in cross-section which is secured by a bonding agent to said hollow case and said linear scale along the longitudinal direction of said linear scale and abutting contact at the outer peripheral surface thereof with rotating members of said bearings, said rotating members being supported on said slider such that they are rotatable about their axes perpendicular to the graduated surface of said linear scale and engagable with said guide bar at portions longitudinally apart from each other, said slider being provided with sliding blocks which are slidably in contact with the graduated surface of said linear scale thereby to maintain a predetermined clearance between said linear scale and said slider.

4,414,747

SURFACE DEVIATION MEASURING DEVICE

Samuel A. Face, Jr., and Samuel A. Face, III, both of P.O. Box 6341, Norfolk, Va. 23508

Filed Aug. 12, 1981, Ser. No. 292,145
Int. Cl.³ G01B *7/28, 7/34*
U.S. Cl. 33—174 P **11 Claims**



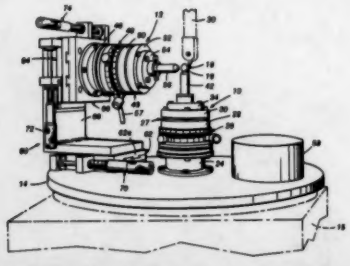
11. In combination with electrical meter means for measuring resistance representing the spacing between a test surface and an electrically conductive datum line, a pair of elongated electrical elements connected to the meter means, supporting frame means for holding the elongated electrical elements in spaced relation to each other, and non-conductive means pivotally connected to one of the elements and engageable with the test surface for establishing a pivot on the test about surface about which the frame means is angularly displaceable to a measuring position in which the elements engage the datum line extending therebetween.

4,414,748

BALL MOUNTING FIXTURE FOR A ROUNDNESS GAGE

Allen L. Gauler, and Donald F. Pasieka, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 16, 1982, Ser. No. 349,224
Int. Cl.³ G01B *7/28, 7/34*
U.S. Cl. 33—174 Q **10 Claims**



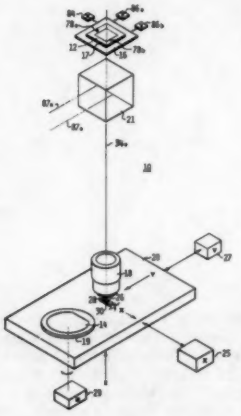
1. A ball mounting fixture for a roundness gage comprising first and second ball chuck assemblies mounted on a base means, each ball chuck assembly including a rotatable stage means and ball chuck means, said ball chuck means being operable to selectively retain a ball to be measured for roundness, each chuck assembly further including positioning means attaching said ball chuck means to said rotatable stage means such that said ball chuck means is adjustably movable radially with respect to the axis of rotation of said stage means, whereby a ball supported by said ball chuck means may be centered on the axis of rotation of the respective stage means by radial adjustment of the position of said ball chuck means, the axes of rotation of said stage means of said first and second chuck assemblies being substantially orthogonal such that a ball to be measured for roundness may be rotated through selected angular increments in any angular orientation by successively supporting and rotating said ball as required with said first and second chuck assemblies.

4,414,749

ALIGNMENT AND EXPOSURE SYSTEM WITH AN INDICIUM OF AN AXIS OF MOTION OF THE SYSTEM

Karl-Heinz Johannsmeier, Los Altos, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Continuation of Ser. No. 53,995, Jul. 2, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,402
Int. Cl.³ G01B *11/27*
U.S. Cl. 33—180 R **28 Claims**



1. Alignment apparatus comprising:

an adjustable holder for holding a first object in a first plane;

imaging means for producing an image of the first object in a second plane;

a stage for holding a second object in the second plane;

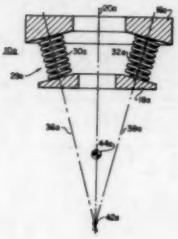
control means for moving the stage along coordinate axes to position the second object with respect to the image of the first object;

an indicium of facilitating alignment of the image of the first object with respect to at least one of the axes of motion of the stage; and

adjustable mounting means for mounting the indicium on the stage in the second plane to facilitate positioning the indicium in alignment with respect to said one of the axes of motion of the stage;

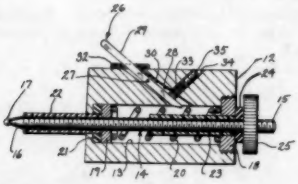
said control means also being operable for moving the stage along the coordinate axes to position the indicium with respect to the image of the first object.

4,414,750
SINGLE STAGE REMOTE CENTER COMPLIANCE DEVICE
Thomas L. De Fazio, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Oct. 19, 1981, Ser. No. 312,513
Int. Cl.³ G01B 5/25
U.S. Cl. 33—185 R **1 Claim**



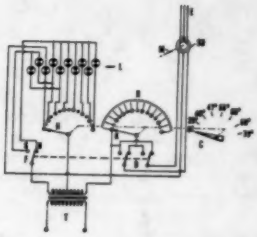
1. A one stage remote center compliance (RCC) device having full translational and rotational compliance comprising:
first and second spaced monolithic members which have a common axis extending therethrough, said stage including at least three discrete compression coil springs spaced about the axis of said monolithic members, each compression coil spring having an axis extending therethrough and being axially disposed along a region conically generated from a focus of the RCC device for interconnecting said monolithic members, each said compression coil spring being axially compressible and laterally deformable for providing both rotational and translational compliance about a remote center of compliance external to said RCC device and spaced from said focus.

4,414,751
BOW SIGHT
Nicholas A. Mathews, 234 Plumb St., Milton, Wis. 53563
Filed Jul. 24, 1981, Ser. No. 286,385
Int. Cl.³ F41G 1/46
U.S. Cl. 33—265 **7 Claims**



1. A bow sight comprising:
a sight support including a supporting block having a bore formed therein;
a sighting pin slideably received within said bore of said sight support and movable between a sighting position and a non-sighting position;
spring means including a compression spring surrounding said pin and housed within said bore for urging said pin into its said sighting position;
latch means mounted on said sight support and with said latch means having a pin-engaging portion movable between an operative position engaged with said pin whereby said pin is held in its said non-sighting position and an inoperative position disengaged from said pin whereby said pin is released and said spring means forces said pin to its sighting position;
said pin including a radially projecting latching face formed by one side of a piston member fixedly connected to said pin, and with said latching face engaging said pin-engaging portion of said latch means; and
means for mounting said sight support on a bow.

4,414,752
DEVICE FOR THE CORRECTION OF AN ERROR IN THE ELECTRIC TRANSMISSION OF AN INDICATION
Piero M. Derossi, Corso Giovanni Lanza 55, Torino, Italy
Continuation of Ser. No. 974,081, Dec. 28, 1978, abandoned.
This application Aug. 22, 1980, Ser. No. 180,393
Claims priority, application Italy, Dec. 30, 1977, 69959 A/77
Int. Cl.³ G01C 19/38
U.S. Cl. 33—320 **7 Claims**



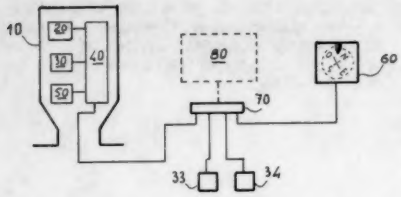
3. A device for the electrical transmission of the indication of a gyrocompass, comprising:
inductor means on a shaft mechanically linked with said gyrocompass for rotation about an axis defined by said shaft, said inductor means including a first, a second and a third winding angularly spaced apart in a Y-connection and centered on said axis;
a source of single-phase alternating current having two terminals;
first circuit means connecting a free end of said first winding to one of said terminals;
second circuit means connecting free ends of said second and third windings to the other of said terminals, said second circuit means including selector means for introducing an impedance difference between the connections extending from said other of said terminals to said second and third windings to impart a corrective angle to the orientation of a magnetic field jointly generated by said windings; and
pick-up winding means for detecting the orientation of said magnetic field and emitting signals representing the gyrocompass indication as modified by said corrective angle.

4,414,753
PROCESS FOR COMPENSATING THE MAGNETIC DISTURBANCES IN THE DETERMINATION OF A MAGNETIC HEADING, AND DEVICES FOR CARRYING OUT THIS PROCESS
Michel Moulin; Jean-Claude Goudon, both of Valence; Jean-Marie Marsy, Bourg-les-Valence; Bernard Legendarme, Valence; Rene Presset, Portes-les-Valence, and Louis Dedreuil-Monnet, Valence, all of France, assignors to Crouzet, Paris, France
Filed Jun. 4, 1981, Ser. No. 270,356
Claims priority, application France, Jun. 5, 1980, 80 12725
Int. Cl.³ G01C 17/38
U.S. Cl. 33—356 **15 Claims**

1. A device for compensating the magnetic disturbances influencing the measurements of a device which determines a magnetic heading on board a land vehicle comprising a magnetometer for furnishing analog voltages proportional to the components of the disturbed magnetic field of the earth, along reference axes of the magnetometer, a memory of a computer

module associated with the magnetometer for receiving so-called compensation coefficients, which make it possible to correct the information delivered by the magnetometer to obtain the real heading, wherein the device further comprises:

means for identifying a closed plane geometrical figure described by an end of a first vector $\overline{Hhp}$ indicative of the disturbed magnetic field when the vehicle rotates on itself through 360° on a horizontal plane;



means for transforming this closed geometrical figure into a circle of any radius centered on the origin of the reference axes of the magnetometer and representing the locus of an end of a second vector $\overline{Hh}$ representative of the non-disturbed magnetic field, and

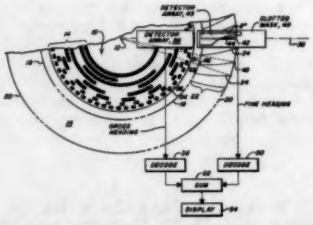
means for calculating the coefficients serving to define the correspondence between all the points of said closed geometrical figure and their homologues on said circle.

4,414,754

HIGH RESOLUTION COMPASS CARD POSITION DECODER

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Mar. 4, 1982, Ser. No. 354,885
Int. Cl.³ G01C *17/28*
U.S. Cl. 33—363 K **29 Claims**



1. A high resolution compass card position decoder comprising:

a compass having a card mounted for rotation within said compass about an axis perpendicular to said card through the center of said card, said compass card having an inner digital encoding pattern and an outer peripheral pattern arranged with respect to the center of said card, said outer peripheral pattern including a series of lines each running at an angle to a radius of said card from an inner circular position to an outer circular position;

means along a first predetermined card radius for decoding the angular position of said card from said digital encoding pattern so as to decode gross compass heading; and

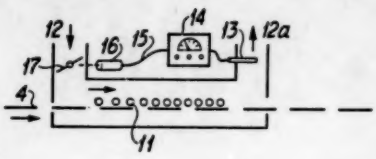
means along a second predetermined card radius for detecting the position along said second radius of one of said lines so as to decode fine compass heading.

4,414,755

DRYING DEVICE INTENDED FOR DRYING MATERIAL BEARING PRINT ISSUING FROM A PRINTING MACHINE

Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Sep. 30, 1981, Ser. No. 307,307
Claims priority, application Sweden, Oct. 1, 1980, 8006847
Int. Cl.³ F26B *21/12*
U.S. Cl. 34—4 **3 Claims**



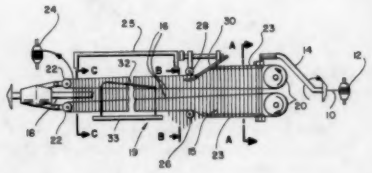
1. A drying device intended for drying material bearing print issuing from a printing machine such as a screen-printing machine, comprising a conveyor for the material and heat-emitting elements arranged adjacent the conveyor, means for establishing a flow of air to pass over the conveyor for the material from an inlet duct to an exhaust duct thereby absorbing volatile substances released by the ink on the material during the drying process, a device for sensing the levels of volatile substances in a given quantity of exhaust air in the exhaust duct, said device being connected to a measuring apparatus for generating an output signal corresponding to the level of volatile substances or for generating an output signal when the level of volatile substances exceeds a predetermined value, an increased proportion of volatile substances in the exhaust air causing a control device to be activated by the output signal to allow a greater quantity of air per unit of time to pass from the inlet duct to the exhaust duct, said output signal being connected for controlling one of a motor for setting a throttle valve located in the inlet duct or a fan motor for regulating the quantity of air per unit of time.

4,414,756

METHOD AND APPARATUS FOR TREATING STRAND-LIKE MATERIAL

Carroll Simpson, Greenville, and Ludwig Schierl, Spartanburg, both of S.C., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Oct. 30, 1981, Ser. No. 316,581
Int. Cl.³ F26B *3/04, 13/12*
U.S. Cl. 34—23 **13 Claims**



1. A method for heat treating strand-like material whereby substantial irregularities in subsequent dyeing of the material is avoided, said method comprising:

(a) drawing said material from a source;

(b) laying said material in loops which surround and are supported by conveyor means;

(c) conveying said material loops by said conveyor means through a heating zone wherein said material experiences shrinking;

(d) causing certain portions of said loop material to experience substantial peripheral sliding movement in their contact with and with respect to said conveyor means during the time the loops are being conveyed through said heating zone; and

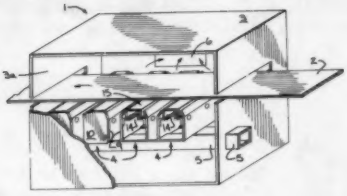
(e) drawing said strand-like material off of said conveyor means.

4,414,757

WEB DRYER NOZZLE ASSEMBLY

Rodger E. Whipple, Neenah, Wis., assignor to Overly, Incorporated, Neenah, Wis.

Filed Oct. 7, 1981, Ser. No. 309,267
Int. Cl.³ F26B *13/20*
U.S. Cl. 34—155 **6 Claims**



1. Apparatus for drying a moving flexible continuous web of material, said apparatus including a nozzle assembly comprising:

(a) a horizontally disposed flat pressure plate adapted to be positioned in spaced relation to the moving web, said pressure plate having an upstream end portion and a downstream terminus portion generally coinciding with the downstream terminus portion of the nozzle assembly,

(b) a primary gas discharge Coanda nozzle disposed at said upstream end portion of said pressure plate and forming means for continuously directing primary gas unidirectionally and horizontally downstream through a gas flow zone between said plate and the moving web,

(c) a single secondary gas discharge nozzle disposed at the downstream terminus of said pressure plate, said secondary nozzle being of the impingement type and forming means for continuously directing secondary gas toward said web and into merging but generally separate interface relationship with said primary gas at a location downstream of said pressure plate terminus,

(d) said impingement type secondary gas discharge nozzle cooperating with the web at said downstream location to form means for increasing the static pressure in said unidirectionally flowing primary gas in said gas flow zone for the full width of said pressure plate,

(e) said secondary gas discharge nozzle being formed by a pair of plates disposed at the said downstream terminus of said pressure plate, with one of said pair of plates being generally vertically oriented and the other of said pair of plates being inclined from the vertical,

(f) said pair of plates converging to form a discharge slot forming means for directing gas generally perpendicularly to said pressure plate.

4,414,758

CONVEYOR FOR COOLING AND REMOVAL OF OBJECTS FROM AN IN-LINE SECTIONAL PRODUCTION MACHINE

Fritz Peter, Binzmühlestr. 405, CH-8046 Zürich, and Gastonge Murialdo, Gaggio di Bioggio, CH-6981 Vernate, both of Switzerland

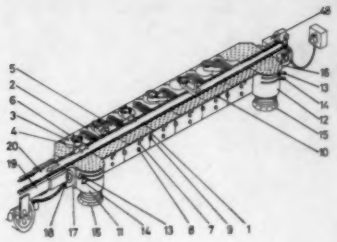
Filed Mar. 23, 1981, Ser. No. 246,420
Int. Cl.³ F26B *25/00*
U.S. Cl. 34—233 **12 Claims**

1. Apparatus for transferring articles from a first position on a cooling plate on one side of a moving conveyor to a second position on said conveyor, said apparatus comprising:

a disc mounted on the said one side of said conveyor for rotation about a first axis;

an arm mounted on said disc for rotation about a second axis spaced laterally from and parallel to said first axis; and

drive means powered by a single drive shaft for rotating both said disc and said arm about their respective axes, the



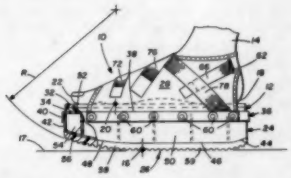
locations of said axes relative to each other and to said first and second positions in combination with the rotational speeds of said disc and arm being such as to cause said arm to engage articles at said first position, to transfer the thus engaged articles from said first position to said second position, and to withdraw from the thus transferred articles in a manner permitting continued movement of said articles by said conveyor.

4,414,759

ORTHOPEDIC SHOE

R. Dean Morgan, 414 Stiles, Midlothian, Tex. 76065; Donald M. Mauldin, 3631 Potomac, Dallas, Tex. 75205, and Thomas L. Taylor, 872 Russell, Bedford, Tex. 76021

Filed Dec. 9, 1980, Ser. No. 214,752
Int. Cl.³ A43B *3/12*
U.S. Cl. 36—11.5 **7 Claims**



1. An orthopedic shoe for wear on a foot by a person while the person is walking on a surface comprising:

an inner sole contoured to conform to the bottom surface of the foot having a first support face for supporting the heel of the foot and a second support face for supporting the metatarsal point of the foot;

an outer sole beneath and spaced from said inner sole having a first contact face beneath said first support face for contacting the surface and a second contact face located beneath said second support face, said outer sole including a fulcrum located between said first and second support faces, said first contact face and fulcrum contacting the surface when the person is standing on the foot and when weight on the foot is applied to said fulcrum and said first contact face, said second contact face being curved upwardly from said fulcrum forward to the toe of the shoe, the metatarsal point of the foot being supported forward of said fulcrum for initiating a rolling motion of the shoe on said second surface as weight is shifted forwardly to

the second contact face of the shoe while the person is walking; and

means for positioning and maintaining the foot adjacent said first and second support faces of said inner sole.

4,414,760

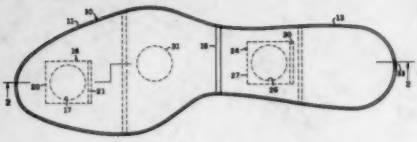
AIR-CUSHION INSOLE

James Faiella, West Palm Beach, Fla., assignor to Kaepa, Inc., San Antonio, Tex.

Filed Apr. 16, 1982, Ser. No. 369,133

Int. Cl.³ A43B *13/40, 13/20*

U.S. Cl. 36—29 10 Claims



1. An air-cushion insole for a shoe, comprising:

(a) an envelope including:

1. a sole portion having a sole compartment, and

2. a heel portion having a heel compartment separate from the sole compartment,

(b) a first valve means including a valve port operatively interconnecting the sole compartment with ambience, a check valve flap over the valve port, the valve flap of the first valve means closing the valve port upon compression of the sole portion, and opening the valve port upon relief of compression of the sole portion to admit air into the sole compartment,

(c) a second port in the sole portion operatively interconnecting the sole compartment,

(d) a second valve means including a valve port and a check valve flap over the valve port, the check valve flap closing the valve port upon compression of the heel portion, and opening the valve port upon compression of the sole portion to admit air into the heel compartment from the sole compartment through the said second port, and

(e) the heel portion providing a first port operatively operatively interconnecting the heel compartment with ambience, the first port exhausting air from the heel compartment upon compression of the heel portion, and admitting air into the heel compartment upon relief of compression of the heel portion.

4,414,761

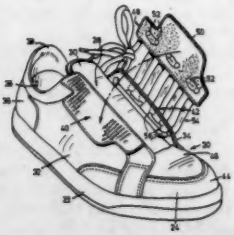
FOOTWEAR ARTICLE WITH ADJUSTABLE CLOSURE

Douglas S. Mahood, 48 Glen Watford Dr., Agincourt, Ontario, Canada (M1S 2C3)

Filed Nov. 2, 1981, Ser. No. 317,375

Int. Cl.³ A43B *11/00;* A43C *1/00*

U.S. Cl. 36—50 7 Claims



1. A footwear article comprising: a sole; an upper which defines a space above the sole for receiving a wearer's foot, the upper including an ankle opening and an access opening which extends from the ankle opening towards the toe area of the article and which is arranged to permit portions of the upper adjacent said access opening to be raised to facilitate movement of a wearer's foot into and from said space; and a closure for said access opening, said closure comprising flexible flap means having a first portion secured to the upper adjacent a first side of said access opening, the flap means across said opening and having a second portion adapted to be releasably secured to the upper adjacent a second side of said access opening, the spacing between the first and second portions being adjustable, releasable and flexible fastening means on said second portion and on the upper for securing the second portion, said second portion of the flap means being a flexible flap member which has part thereof permanently affixed to the upper in a non-pivotal manner, whereby alignment of the flap member on the upper is readily accomplished by laying the flap member against the upper in its natural configuration.

4,414,762

SLIPPER FOR A SKI BOOT, AND PROCESS FOR ITS MANUFACTURE

Georges P. J. Salomon, Annecy, and Alain Leveque, La Balme de Sillingy, both of France, assignors to Etablissements Francois Salomon & Fils, Annecy, France

Filed Oct. 22, 1981, Ser. No. 313,918

Claims priority, application France, Oct. 31, 1980, 80 23549

Int. Cl.³ A43B *5/04, 7/14;* A43D *9/00*

U.S. Cl. 36—117 8 Claims

1. Process for the manufacture of a slipper for a ski boot comprising the injection of a plastic foam mixture between the walls of two socks, comprising an inner sock and an outer sock, placed on a form which is put in a mold, including the steps of

(a) producing said outer sock constituting the outer skin of said slipper from a thin, expansible sheet; and

(b) adjusting said outer sock to said inner sock constituting the inner wall of said slipper;

(c) said outer sock having dimensions no larger than those of said inner sock when both of said socks are in a state of rest.

4,414,763

SOLE FOR A SPORTS SHOE OR BOOT

Alfred Bente, Herzogenaurach, Fed. Rep. of Germany, assignor to Messrs. Adidas Sportschuhfabriken Adi Dassler KG, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,909

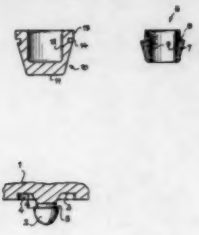
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3212980

Int. Cl.³ A43C *15/02*

U.S. Cl. 36—134 10 Claims

1. A sole for a sports shoe comprising: fixing protrusions which project from the underside of the sole, each fixing protrusion comprising a shoulder facing towards the underside of the sole; a sleeve member adapted to be fitted on to each fixing protrusion and comprising a wall portion which in the fixed position is disposed around said fixing protrusion, said wall portion having at least one opening therein, and a latching means disposed movably in said at least one opening and adapted in an operative position to engage behind said shoulder on the respective fixing protrusion, with a portion of said

latching means still projecting outwardly of said opening; and a ground engaging projection member adapted to be fitted



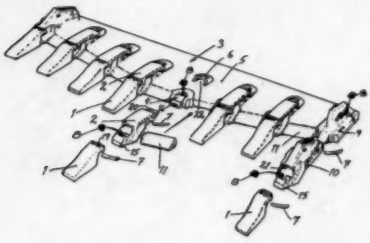
over each said sleeve member and in frictional engagement with said outwardly projecting portion of said latching means.

4,414,764

WEAR PARTS SYSTEM

Arne Johansson; Torsten Larsson, both of Karlskoga, and Ove Nilsson, Örebro, all of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 22, 1982, Ser. No. 360,867
Claims priority, application Sweden, Mar. 26, 1981, 8101935
Int. Cl.³ E02F 9/28
U.S. Cl. 37—141 T 4 Claims



1. A system for holding teeth to an earth moving machine shovel front comprising:

at least one tooth member having a rearwardly extending overhang, and a male projecting part rearwardly extending from said overhang;

an adapter having a forward opening female part receiving said male projecting part, said adapter also having a rearwardly extending overhang and male projecting part rearwardly extending from said overhang;

a cover member connected to said shovel front having an opening for receiving said adapter male projecting part;

a first tunnel through said adapter overhang and front shovel front part;

a second tunnel through said tooth overhang and said adapter;

said tunnels having surfaces forming locking surfaces, one of said surfaces comprising an edge of a right angled groove in a respective overhang, and the remaining surfaces comprising an opposite edge on a shovel front and tooth member;

first and second wedges inserted in said tunnels, said wedges being arcuate along a longitudinal direction and including teeth along opposite edges; and

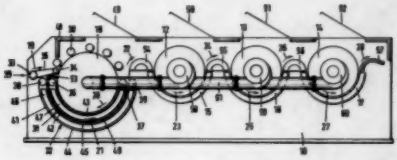
first and second compressible locking devices having a toothed end extending through a groove in a respective locking surfaces for engaging teeth of said wedges, said locking devices maintaining said wedges in place.

4,414,765

STEAM MANGLE WITH HEAT RECYCLING TO PREDRYER

Manfred Kreinberg, Vlotho, and Lothar Petzold, Bad Salzuflen, both of Fed. Rep. of Germany, assignors to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Mar. 10, 1981, Ser. No. 242,211
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041244
Int. Cl.³ D06F 65/10
U.S. Cl. 38—54 13 Claims



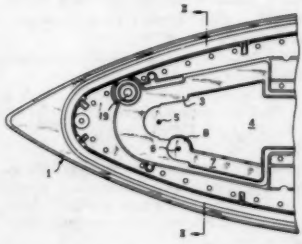
1. A mangle for pressing and drying damp laundry articles including a plurality of rotatably mounted, padded, perforated hollow drums attached to a vacuum device, and an equal plurality of cooperable, perforated, curved hollow troughs which define transport paths with the drums and which are heated by high pressure steam, characterized by: a rotatably mounted hollow imperforate pre-dryer cylinder (18) disposed in front of the drums (12–14) in the operating direction, means for heating the cylinder with used steam condensate withdrawn from the troughs, and means for conveying the laundry articles around and in frictionless contact with the outer wall of the cylinder.

4,414,766

STEAM IRON SOLE PLATE DESIGN

Pierre Schwob, Lyons, France, assignor to SEB S.A., Selongey, France

Filed Sep. 1, 1981, Ser. No. 298,372
Claims priority, application France, Sep. 10, 1980, 80 19492
Int. Cl.³ D06F 75/18
U.S. Cl. 38—77.83 3 Claims

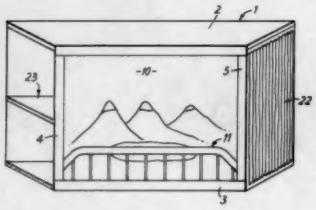


1. An electric steam iron, comprising a metallic sole-plate having a boss and a heating element, cast in said boss, said boss enclosing a vaporization chamber, a main injection device connected to a water reservoir for injecting water into said vaporization chamber adjacent to said boss, and an auxiliary injection device for injecting a supplementary amount of water for obtaining an instantaneous surplus of steam, said auxiliary injection device emptying into the vaporization chamber at a point situated on the boss just above the heating element cast in said boss, the metal of the boss in the area around said point being thin so that the heating element cast in said boss is close to said point, said area being in communication with the vaporization chamber.

4,414,767
ROOM DECORATION

Eric Staton, 34 Broad Walk, Winchmore Hill, London N.21, England

Filed Aug. 18, 1981, Ser. No. 293,940
Claims priority, application United Kingdom, Aug. 26, 1980, 8027600
Int. Cl.³ G09F 19/00
U.S. Cl. 40—429 5 Claims



1. A decoration structure, especially for a room, comprising a stationary structure bounding an opening, an elongate background strip bearing serially on a face thereof a plurality of items of background subject matter each of which is of such dimensions as to occupy the opening of the structure, respective roller means on said structure at spaced positions at each side of said opening to carry said background strip and permit rolling up and unrolling of said strip for the presentation of a selected item in said opening, a foreground element positioned on said structure in said opening and having an item of foreground subject matter adapted to cooperate with the selected background item in the formation of an entire scene, and foreground element being spaced forwardly of said background strip, and means on said structure for illumination of at least part selectively of the background item of the foreground item, wherein selectively the foreground item and the background item is transparent or translucent and comprises a plurality of zones which are different coloured and which are arranged symmetrically or non-symmetrically.

4,414,768
DISPLAY PANEL FOR VENDING MACHINES

G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

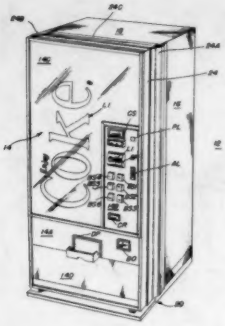
Division of Ser. No. 244,818, Mar. 17, 1981. This application Jan. 20, 1982, Ser. No. 341,014
The portion of the term of this patent subsequent to Apr. 19, 2000, has been disclaimed.
Int. Cl.³ G09F 7/00
U.S. Cl. 40—584 10 Claims

1. A vending machine including a control panel having a coin slot, an array of product selector buttons for controlling the vending of primary and secondary products from said machine and a sign panel having logo thereon representative of the primary product, comprising:

first and second adjacent vertical columns of secondary product selector buttons, each having a secondary product display area thereon bearing indicia representative of a given secondary product to be vended;

a primary product selector button, which is larger than the respective secondary product selector buttons, positioned above said secondary product selector buttons adjacent said coin slot, said primary product selector button being so shaped and so proportioned as to overlie and extend across both said vertical columns of secondary product selector buttons and presenting a primary product display area thereon larger than said secondary product display area to provide a dominant presence therein in said control panel; and

said primary product display area bearing substantially the same primary product logo as said sign panel inducing, in conjunction therewith, the predominate selection of said

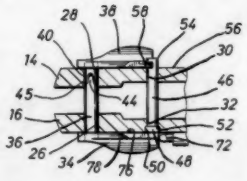


primary product over said secondary products by a user of said vending machine.

4,414,769
AMBIDEXTROUS SAFETY FOR GUNS

Herman W. Mueschke, 1003 Columbia St., Houston, Tex. 77008

Filed Jan. 26, 1981, Ser. No. 228,541
Int. Cl.³ F41C 17/00
U.S. Cl. 42—70 R 18 Claims



1. An ambidextrous safety system for guns wherein such guns are adapted for efficient use by both right and left-handed users, and the guns incorporate a frame defining pivot bore means, said safety system comprising:

a right-hand safety means having first pivot shaft means extending into said pivot bore means;

left-hand safety means having second pivot shaft means extending into said pivot bore means;

connection means establishing nonrotatable relation between said first and second pivot shaft means, in the assembled relation of said first and second shaft means said connection means being positioned within said pivot bore means and said pivot bore means providing structural support for said connection means;

pin means extending through registering shaft apertures in the frame of said gun, said pin means having movable interlocking relation with said left-hand safety means to retain said left-hand safety means in assembly with said handgun.

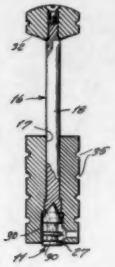
4,414,770
MAXI-BALL LUBRICATOR

Charles E. Brinton, Sr., 1110 Penn St., Harrisburg, Pa. 17102

Filed Apr. 5, 1982, Ser. No. 331,669
Int. Cl.³ F41C 27/00
U.S. Cl. 42—90 2 Claims

1. A maxi-ball lubricator, comprising, in combination, a

cylinder and a plunger assembly slidable in said cylinder, a seat on one end of said cyylinder for a maxi-ball bullet to be seated therein, while a hole in a side of said cylinder receives a lubricant container spout for discharging a lubricant into said seat and against said maxi-ball, and said plunger assembly being aligned with said seat for pushing said maxi-ball outward of



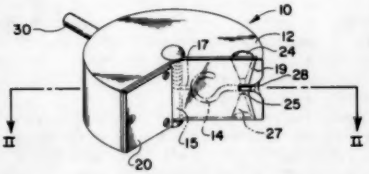
said seat and into a rifle muzzle; said plunger assembly comprising a push rod having an enlarged head at one end for pushing against an end of said maxi-ball, while an opposite end of said push rod is fitted with an enlarged knob for being grasped in a hand, and said push rod head having a conical recess in its end for receiving a conical point portion of said maxi-ball.

4,414,771

METHOD AND APPARATUS FOR STORING, DISPENSING AND TYING FISH HOOKS

Harley D. Martin, 154 Willow Pl. South, Broomfield, Colo. 80020

Filed May 11, 1981, Ser. No. 262,095
Int. Cl.³ A01K *97/06*
U.S. Cl. 43—4 **18 Claims**



9. Apparatus for guiding and assisting in tying fish line to stored fish hooks, the apparatus comprising:

a body portion in the form of cylinder partially generated around a central axis, the body portion including an arcuate channel defined therein around the central axis and of a cross-section suitable for slidably securing a fish hook within the channel;

an end surface of the body portion defined by a plane extending from the central axis radially outward and communicating with the channel to provide an end opening of the channel at the end surface;

a pivot member disposed at the central axis;

spring means carried on the pivot member and extending into the channel to bear towards the end surface;

a resilient containment member positioned at the end surface to nominally close the channel thereat, the containment member being attached to the body portion at a position adjacent the central axis thereof and extending in a cantilevered manner outwardly therefrom; and

at least one funnel shaped opening defined in the body portion adjacent the end surface at the portion of the channel adapted to receive the eye portion of a fish hook, the funnel opening communicating with a second opening extending through the body portion and opening to the containment member;

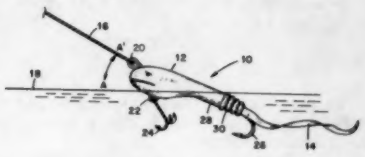
whereby fish hooks may be disposed in the channel and maintained against the containment member by the spring means such that a fish line may be guided by the funnel shaped opening through the eye of a fish hook, a knot tied around the eye of the fish hook, and the fish hook and line removed from the channel by resiliently moving the containment member away from the end surface to permit removal of only the tied fish hook from the channel.

4,414,772

TOP WATER FISHING LURE

Samuel E. Duncan, 1514 Hidden Hills, Clinton, Tenn. 37716

Filed Jul. 2, 1981, Ser. No. 274,725
Int. Cl.³ A01K *85/00, 83/06*
U.S. Cl. 43—42.36 **2 Claims**



1. A top water fishing lure, comprising: a keeled and buoyant body portion, said body portion having an anterior end and a posterior end, said body portion having a first aperture extending downwardly through said anterior end thereof, said body portion having a second aperture extending downwardly partially through said body at a position posterior to said first aperture, and said body portion having a groove extending along the anterior-posterior centerline at the top surface of said body portion to connect said first and second apertures; a non-floating tail portion connected to said body portion at said posterior end thereof; a wire having a first loop disposed in said groove in the anterior portion of said body portion for receiving a fishing line, said wire having a second loop disposed in said first aperture and a third loop located in said second aperture; a first fishhook attached to said second loop disposed in said first aperture, a second fishhook attached to said third loop in said second aperture located at a position in said body portion posterior to said first aperture; and means disposed about the shank portion of said second fishhook for frictionally restraining a plastic dressing forming said tail portion onto the posterior end of said body portion, said lure having the general appearance of a reptilian creature.

4,414,773

SAFETY DEVICE FOR ANIMAL TRAP

Thomas L. Moyers, 2370 Sunset Strip, Mountain Home, Id. 83647

Filed May 7, 1981, Ser. No. 261,486
Int. Cl.³ A01M *23/28*
U.S. Cl. 43—97 **16 Claims**

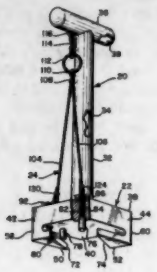
1. A safety device for animal traps of the rotating frame type having parallel spring-biased jaws when the trap is in set or open position, said device including

(a) a body portion,

(b) a first means extending from said body portion for holding the trap jaws in set or open position, said first means including stationary members engaged with said body portion and lying in spaced relation to each other and to said body portion, whereby the trap jaws may be positioned between the spaced members and body portion,

(c) a second means including at least one pin carried by said

body portion and positioned to locate one of the jaws between a portion of said first means and said pin upon application of the device to the trap, and



(d) means for retracting said pin into said body portion during application of the device of the trap.

4,414,774

FASHION AND HAIRSTYLE DOLL PLAY SET

A. Edward Fogarty, and Bonnie R. Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579

Filed May 13, 1982, Ser. No. 377,608

Int. Cl.³ A63H *3/00*

U.S. Cl. 46—22 **9 Claims**

1. A fashion and hairstyle doll play set, comprising:

(a) a self-standing, three-dimensional doll having (i) a rigid or semi-rigid body with integrally formed limbs and indicia simulating clothing, said body being configured such that its arms extend out from the body and downward from its shoulders at essentially forty-five degree angles, its waist being in the form of a right circular cylinder, and its hips, legs and feet being dimensionally smaller than the diameter of its waist in all horizontal planes below its waist, and (ii) a semi-rigid or flexible head with an integrally formed sculptured hair design, said head having an essentially horizontal, encircling recess above the lower periphery of said sculptured hair design;

(b) at least one semi-rigid or flexible, hollow article simulating an article of lower body clothing, said article having a pair of opposed open ends, and, positioned in one of said open ends, an integrally formed ring which flexes to engage said waist of said body of said doll to removeably attach said article to said body of said doll; and

(c) at least one article simulating both an article of headgear and coiffured natural hair, said article having a semi-rigid or flexible element which flexes to engage said recess above said lower periphery of said sculptured hair design of said head, and, fixedly attached to said element, coiffured strands of artificial hair.

4,414,775

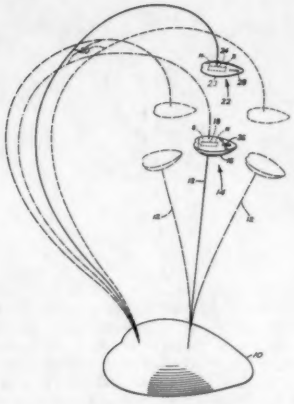
MAGNETIC KINETIC AMUSEMENT DEVICE

Flemming E. Jensen, 7911 NE. 33rd Ave., Unit 340, Portland, Oreg. 97211

Filed Apr. 26, 1982, Ser. No. 371,671

Int. Cl.³ A63H *33/26*

U.S. Cl. 46—241 **8 Claims**



1. A magnetic amusement device comprising:

(a) a base,

(b) a first resilient wire support mounted on the base and extending upwardly therefrom,

(c) a first magnetic member secured to the outer end of the first resilient wire support,

(d) a second resilient wire support mounted on the base and extending upwardly in a substantially continuously arcuate, reversely bent configuration to a plane above the plane of the first magnetic member, and

(e) a second magnetic member secured to the outer end of the second resilient wire support,

(f) the first and second magnetic members being arranged separably in vertical spaced opposition to each other when in static condition, being mutually magnetically attractable into contact with each other against the tension of their resilient wire supports when moved into close proximity to each other,

(g) whereby, upon moving one of the magnetic members away from the other and releasing it, prolonged to and fro up and down relative movement of the magnetic members occurs, induced by the attracting magnetic forces and opposing resilient wire forces, such relative movement eventually terminating in the releasable uniting of the magnetic members as the magnetic forces prevail.

4,414,776

FIBROUS WEB FOR PLANTING SEEDS, METHOD OF USING SAME, APPARATUS FOR PRODUCING SAME

Harry J. Ball, P.O. Box 3009, Milford, Conn. 06460

Continuation-in-part of Ser. No. 169,856, Jul. 17, 1980, Pat. No. 4,357,780, which is a continuation-in-part of Ser. No. 971,603, Dec. 30, 1978, abandoned. This application Mar. 29, 1982, Ser. No. 363,078

Int. Cl.³ A01C *1/04*

U.S. Cl. 47—56 **7 Claims**

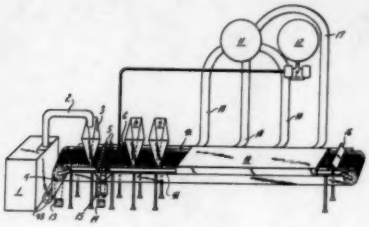
1. The method of forming a fluffy uncompressed rolled seeded or unseeded straw-like mulch mat capable of being unrolled, which derives its entire structural strength and unity from tissue paper backing on which randomly oriented, unmodified, natural, elongated, straw-like cellulosic fibers, bonded together through spot contact bonding between contiguous straws and between the tissue paper backing and the

straws by a water soluble adhesive which due to the mat's density and thickness is spread substantially throughout, including the steps of,

feeding onto tissue paper backing on a conveyor a mat of fluffy randomly oriented, unmodified, natural, elongated and dry straw-like cellulosic fibers,

spraying water soluble adhesive onto said straw-like cellulosic fibers,

spreading onto the adhesive a predetermined amount of



granular material from the class comprising seed and fertilizer,

drying the adhesive and thereby bonding the straw-like fibers together and to the tissue paper backing and securing the granular material to the straw-like fibers by the adhesive on the straw-like fibers providing spot contact bonding only between contiguous fibers and with the granular material, and

rolling the mat into a roll for storage and unrolling at the location of use.

4,414,777

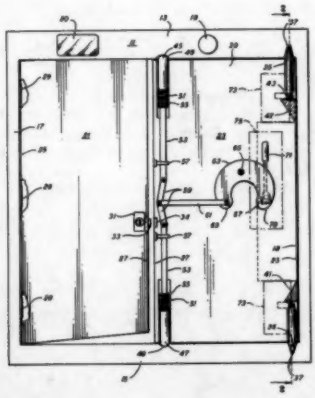
BREAK AWAY WALL STRUCTURE

John Masacchia, P.O. Box 452, Marathon, Fla. 33050

Filed Nov. 10, 1980, Ser. No. 205,882

Int. Cl.³ E05B *65/10*; E05C *15/02*

U.S. Cl. 49—141 **2 Claims**



1. A break away wall structure comprising:

a frame;

a door panel pivotably mounted along one edge within said frame;

a wall panel, said wall panel and said door panel each having one edge abutting each other, said wall panel being pivotably mounted along one edge within said frame;

a locking means including a tongue slidably mounted on the door panel and extending into the wall panel;

a pair of opposed vertically-oriented plungers slidably mounted in said wall panel along the edge abutting the door panel and extending into said door frame, each of said plungers having a semi-spherical shape;

a pair of opposed vertically-oriented rods slidably mounted in said wall panel aligned with said pair of opposed vertically-oriented plungers, said pair of opposed vertically-oriented plungers being slidably mounted on said rods;

a pair of vertically-oriented arms, each of said vertically-oriented arms being secured at one end to the end of a different one of said rods;

spring means mounted on said rods between said opposed vertically-oriented plungers and said arms to force said opposed vertically-oriented plungers into said door frame;

a pair of actuating levers, each pivotally connected at one end to the end of a different one of said arms remote from said rods and the other end of said actuating levers being pivotably connected to one another; and

means including a handle pivotably mounted within said wall panel and pivotably connected to said pair of actuating levers where said actuating levers are connected to one another to pull said actuating levers toward said handle thereby pulling said vertically-oriented arms and vertically-oriented rods toward said levers and releasing said opposed vertically-oriented plungers from said door frame.

4,414,778

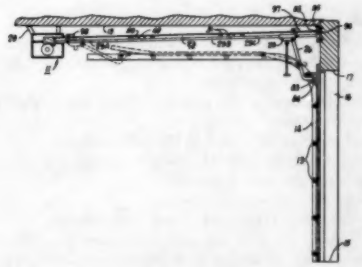
TAPE DRIVE DOOR OPERATOR

Alvin J. Carli, Sebring, Ohio, assignor to The Alliance Manufacturing Company, Inc., Alliance, Ohio

Filed Apr. 13, 1981, Ser. No. 253,689

Int. Cl.³ E05F *11/00*

U.S. Cl. 49—199 **22 Claims**



1. A garage door operator comprising, in combination:

a base;

elongated guide rail means having one end secured to said base and adapted to be mounted in a garage in a direction substantially parallel to at least part of the opening and closing movement of a garage door;

first and second lengthwise guide channels in said guide rail means;

a motor;

a drive wheel journalled on said base;

means connecting said drive wheel for drive by said motor;

a flexible elongated tape having a first run longitudinally disposed in said first guide channel and a second run disposed in said second guide channel;

a web connected to a lower flange of the guide rail means;

said first and second tape guide channels being disposed in said lower flange;

means establishing a positive drive engagement between an

arcuate portion of said tape and at least a 90° arcuate portion of the periphery of said drive wheel;

a carriage longitudinally guided on said guide rail means;

surfaces defining a longitudinal slot in said guide rail means;

means extending through said longitudinal slot and interconnecting said carriage and said first run of tape for movement therewith;

a link connected to said carriage and adapted to be connected to any said garage door for opening and closing movements by movement of said tape;

said first run of tape being stressed in tension during the opening movement of the door operator; and

said first guide channel closely enveloping and guiding said first run of tape on both sides and both edges sufficiently to prevent any substantial buckling of said first run of tape under compression forces during closing movement of the door, yet transmitting to the door during closing movement a lesser force than during the opening movement for an increase in safety of door operation.

4,414,779

WINDOW REGULATOR FOR AN AUTOMOTIVE VEHICLE

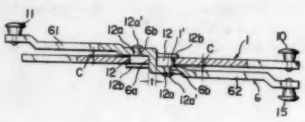
Kinichi Ishii, Yokohama, Japan, assignor to Kabushiki Kaisha Johnan Seisakusho, Japan

Filed Nov. 23, 1981, Ser. No. 324,079

Claims priority, application Japan, Dec. 13, 1980, 55-176233

Int. Cl.³ E05F *11/44*

U.S. Cl. 49—351 **6 Claims**



1. An improved X-arm type window regulator for an automotive vehicle for raising and lowering a window pane for a vehicle door which includes:

a movable guide rail (**8**) attached to the lower edge of the window pane;

a fixed guide rail (**9**) fixed to the vehicle door;

a plurality of rollers (**10, 11, 15**) movable along said movable guide rail and said fixed guide rail,

the improvement which comprises:

(1) a main arm (**1**) one end of which moves along said movable guide rail with one of said rollers rotatably attached thereto and the other end of which is pivotably supported on the vehicle door, said main arm being formed with a middle pivot hole (**1'**) therein;

(2) a crank-like subarm (**6**) having a first subarm portion (**61**), a second subarm portion (**62**), and a stepped portion to connect the first and second subarm portions, one end of which moves along said movable guide rail with one of said rollers rotatably attached thereto, the other end of which moves along said fixed guide rail with one of said rollers rotatably attached thereto, and the stepped portion of which is loosely positioned in the middle pivot hole of said main arm perpendicular to the plane of the middle pivot hole of said main arm by passing one end thereof through the middle pivot hole of said main arm; and

(3) a pair of arc-shaped, roughly semicircular pivots (**12**) to rotatably support said crank-like subarm on said main arm with the stepped portion of said subarm sandwiched therebetween in the middle pivot hole of said main arm,

whereby a compact X-arm can be realized by using one main arm and only one subarm.

4,414,780

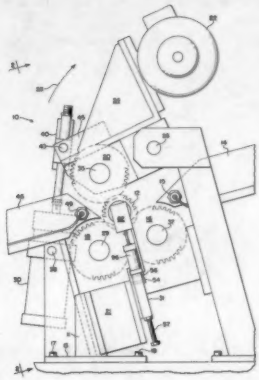
GEAR BURNISHING AND HONING MACHINE

Arne R. Jorgensen, 1041 S. Norbury, Lombard, Ill. 60148

Filed Aug. 21, 1981, Ser. No. 295,173

Int. Cl.³ B24B *29/00, 15/00*

U.S. Cl. 51—26 **11 Claims**



1. A gear finishing machine comprising a plurality of rotational finishing elements which surround a work station, at least one of said finishing elements being a driven element, drive means for rotating said finishing elements, feed means for supplying a workpiece gear into said work station where it engages said finishing elements, and reciprocating means for imparting periodic reciprocating motion to said workpiece gear with respect to said rotating finishing elements at a rate independent of the rotation of said finishing elements, said reciprocating means including support means for holding said workpiece gear, said reciprocating means comprising a rotatable shaft, resilient rotary-to-linear motion converting means coupled to said shaft and said support means whereby linear motion is imparted to said workpiece gear, said converting means comprises a pair of spaced-apart leaf springs whereby said machine is capable of performing finishing operations at widely varying frequencies of reciprocation.

4,414,781

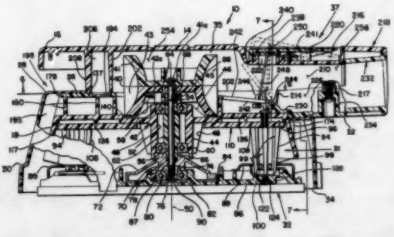
TURBINE SANDER

Colin Overy; Anthony J. Langenberg, both of Brockville, Canada; Arthur Powell, Baldwin, and Stanley Rodowsky, Jr., Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Sep. 1, 1981, Ser. No. 298,308

Int. Cl.³ B24B *23/00, 47/06*

U.S. Cl. 51—170 MT **7 Claims**



1. A housing for a turbine-driven tool, comprising:

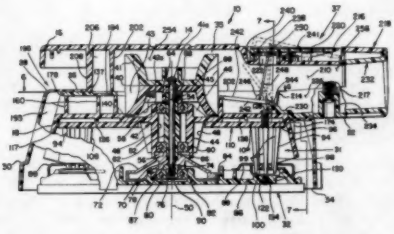
(a) a first one-piece housing member having a first turbine chamber wall and a first valve chamber wall;
(b) a second one-piece housing member defining a nozzle having two opposing walls, and having a second turbine chamber wall and a second valve chamber wall;
(c) the first one-piece housing member being connected to the second one-piece housing member with the first and second turbine chamber walls forming a turbine chamber and the first and second valve chamber walls forming a valve chamber;
(d) the nozzle and the valve chamber being adjacent to and connected with the turbine chamber;
(e) connecting means for fastening the first housing member to the second housing member to simultaneously provide alignment and structural support for the housing members;
(f) the connecting means including a first elongated support member extending from the second housing member adjacent one of the two opposing nozzle walls and being received within the first housing member;
(g) the connecting means further including a fastener connecting the first housing member to the second housing member via the first elongated support member;
(h) a removable nozzle cover plate located adjacent the nozzle and having a first mounting aperture, and having a rear portion sandwiched between the first and second housing members;
(i) the nozzle cover plate being located upon the second housing member such that the first elongated support member is insertable through the first mounting aperture;
(j) the nozzle cover plate rear portion having a curved flashed portion providing an air seal adjacent the nozzle connection with the turbine chamber; and
(k) the nozzle cover plate further including a plurality of noise attenuation holes.

4,414,782

DIRECT DRIVE SYSTEM FOR A TURBINE SANDER

Anthony J. Langenberg, Brockville, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 1, 1981, Ser. No. 298,311
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—170 MT **8 Claims**



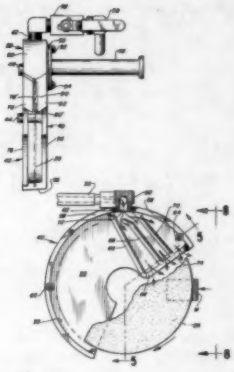
1. An air-driven pad sander having a housing connected to a vacuum source, comprising:
(a) a one-piece thermoplastic shaft having two ends and being rotatably journalled in the housing;
(b) the shaft having a longitudinal axis and defining a clearance bore coaxial with the longitudinal axis;
(c) a turbine powered by air flowing to the vacuum source and mounted on one end of the shaft;
(d) the turbine having a turbine axis of rotation coincident with the shaft longitudinal axis;
(e) a counterweight operatively connected to the other end of the shaft;
(f) the counterweight including a bushing portion located eccentrically to the longitudinal axis of the shaft;
(g) a connecting member slidingly mounted in the shaft clearance bore and connecting the turbine to the bushing portion; and
(h) a platen connected to the housing and operatively associated with the bushing portion.

4,414,783

COOLANT SYSTEM FOR ROTATING BLADE CUTTER

Donald P. Vincent, Lake Zurich, Ill., assignor to Buehler Ltd., Lake Bluff, Ill.

Filed Aug. 19, 1981, Ser. No. 294,379
Int. Cl.³ B24B *55/02, 55/04*
U.S. Cl. 51—267 **8 Claims**



1. A coolant supply system for use with a cutter of the type having a vertically disposed motor-driven rotatable cutter wheel, a workpiece holder which is movable to feed a workpiece into engagement with a front portion of the cutter wheel for a cutting operation, and a wheel guard, the improvement comprising, in combination, wheel guard means covering an upper portion of said cutter wheel while leaving a front portion exposed for engagement with a workpiece, said wheel guard means having a top wall and a pair of opposed side wall portions which cover opposite sides of the upper portion of said cutter wheel, a coolant inlet opening formed in said wheel guard means generally above said cutter wheel and located to distribute coolant downwardly on both sides of said wheel within a space defined by said opposed side wall portions, and a coolant supply conduit connected to said coolant opening for supplying coolant to the interior of said wheel guard means on both sides of said cutter wheel, at least one of said wheel guard side wall portions has directional vanes formed on the inside thereof for directing coolant from said coolant inlet opening toward a front exposed portion of said cutter wheel where the same is engaged by a workpiece to be cut.

4,414,784

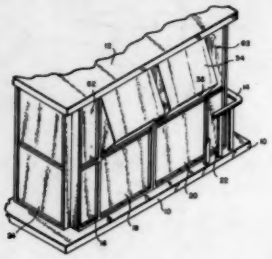
GREENHOUSE STRUCTURE

Richard M. Masters, 1 Burns Rd., Lexington, Mass. 02173

Filed Feb. 2, 1981, Ser. No. 230,853
Int. Cl.² E04b *1/34*
U.S. Cl. 52—73 **3 Claims**

1. A prefabricated enclosure module for installation within an opening between the roof and floor of an apartment house balcony to provide an enclosed balcony comprising a rectangular frame having spaced, parallel top and bottom members and spaced, parallel side members, a divider member positioned substantially midway between the top and bottom members and parallel thereto extending continuously tranversely of the frame from one side member to the other, said divider member, in conjunction with the top member and the portions of the side members above it, defining an opening above the

divider member and said divider member, in conjunction with the bottom member and the portions of the side members below the divider member, defining an opening below the divider member, a window sash coextensive in length and height with the opening above the divider member defining a window opening, means at opposite sides of the sash pivotally mounting the sash within the opening above the divider member for rotation about a horizontal axis, a closure positioned in the opening in the window sash, comprising spaced, parallel side walls spaced apart a distance corresponding to the width of the opening in the window sash and perpendicular to the plane of the opening of right triangular configuration having long and short sides with the long sides extending downwardly and outwardly from the top of the opening and the short sides extending upwardly and outward from the bottom of the open-



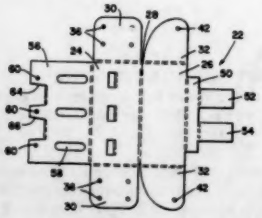
ing, and transverse walls joining the long and short edges of the side walls, said side walls and transverse walls being integral, the transverse wall joining the long sides of the side walls defining an outwardly and upwardly-facing transparent panel and said side walls defining vertical transparent panels and the transverse wall joining the short sides of the side walls defining an inwardly and upwardly-facing reflecting panel, said window sash being pivotal about its horizontal axis to adjust the angle of reflected light entering through the transparent panel and reflected by the reflecting panel into the balcony enclosure, and clamping members releasably securing the top and bottom of the frame to the roof and floor, respectively, said clamping members being structured to fix the frame within the opening by frictional engagement with the surfaces of the roof and floor of the structure of the balcony.

4,414,785

CONSTRUCTION FRAMING ANCHOR

Venice T. Howell, 1425 Cabrillo Ave., Burlingame, Calif. 94010

Filed Nov. 24, 1980, Ser. No. 209,693
Int. Cl.³ E02D *27/00*; E04B *1/38*
U.S. Cl. 52—169.1 **4 Claims**



1. In a framing anchor for securing the lower end of a vertical underpinning to a sill mounted on a concrete footing of a foundation embedded in the ground to support a building structure, said footing defining a sloping top surface corresponding generally to the slope of the ground in which said footing is disposed, said framing anchor being adjustable so that the underpinning may be held in a vertical position even though the top surface of said foundation may be varied in its angle of slope, said framing anchor including a lower inclined plate resting on the top ofsaid sill and an upper horizontal plate having the lower end of said vertical underpinning resting thereon, said lower and upper plates being joined together at one side of said framing anchor by a flexible interconnecting section, the improvement comprising:

means for integrally locking said lower inclined plate to said upper horizontal plate independently of said underpinning including:

at least one upwardly extending tab integrally connected with said upper horizontal plate on the side thereof opposite said flexible interconnecting section, said tab having said lower end of said underpinning abutted thereagainst; and

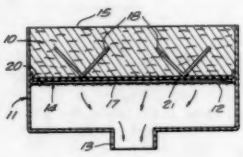
an upwardly extending flange formed integrally with said lower inclined plate on the side thereof opposite said flexible interconnecting section, said upwardly extending flange being positioned adjacent said underpinning and in a juxtaposed relationship with said tab, said tab being bendable over said second upwardly extending flange.

4,414,786

HEAT INSULATING MODULE FOR HIGH TEMPERATURE CHAMBERS

Carl E. Frahme, 26508 Sand Canyon, Canyon Country, Calif. 91351

Continuation-in-part of Ser. No. 135,138, Mar. 28, 1980, abandoned. This application Aug. 18, 1981, Ser. No. 293,970
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—506 **36 Claims**



1. A heat insulating module for use in high temperature chambers comprising:

a module backing comprising a reticulated member having a plurality of elongated anchor members secured to spaced apart points inwardly of the perimeter of one face thereof before refractory fibers are accreted thereonto with a major portion of said anchor members inclined to said reticulated member; and

a thick mat of discrete refractory fibers bonded together by an inorganic bonding agent accreted onto said one face and about said anchor members by vacuum deposition from an aqueous slurry of said refractory fibers to a thickness substantially exceeding the height of said anchor members above said reticulated member.

4,414,787

ROOF TRUSS ASSEMBLIES FOR HIPPED ROOFS, AND METHOD OF MANUFACTURING SAME

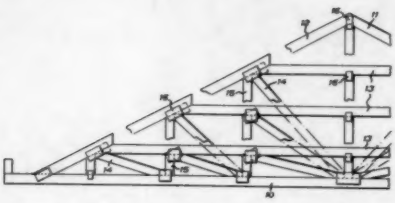
Burkhard Kappen, Skogslundsgatan 31, S-731 00 Köping, Sweden

Filed Jan. 19, 1981, Ser. No. 226,004
Claims priority, application Sweden, Feb. 4, 1980, 8000849
Int. Cl.³ E04B *7/08*; E04C *3/42*
U.S. Cl. 52—643 **2 Claims**

1. A roof truss assembly for use in supporting hipped roofs comprising:

a plurality of roof trusses each having the same ceiling joist length, said trusses having different heights ranging from

a maximum to a minimum in a pre-determined number of height reduction steps, the trusses of less than said maximum height having a rafter piece which extends generally parallel to said ceiling joists, each of said trusses also having a rafter at opposite ends thereof extending generally at an angle from the highest portion of the truss to the ceiling joist;



a plurality of vertical struts disposed in each of said trusses extending from said ceiling joists to said rafters and said rafter pieces, each of said trusses having the same number of vertical struts, one of said vertical struts being generally centrally disposed in each truss, and the remainder of said vertical struts being spaced symmetrically about said central strut and equidistantly from one another; and

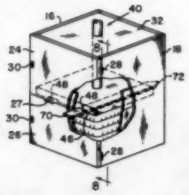
a plurality of diagonal struts each extending generally from the top of a vertical strut to the ceiling joist.

4,414,788

METHOD AND MEANS FOR PACKAGING EXPANSIBLE PRODUCTS

Allan Berg, 85 Alhambra Dr., Oceanside, N.Y. 11572

Filed Jun. 1, 1981, Ser. No. 269,358
Int. Cl.³ B65B *1/24*
U.S. Cl. 53—436 **13 Claims**



3. In a method for packaging expansible products in their fully expanded condition in a container, said method comprising the steps of:

introducing into a compressing apparatus having a side opening at least a container having an interior accessible through at least one open side thereof;

further introducing into the compacting apparatus through the side opening thereof products in their fully expanded condition to be packaged within the container through the container opening;

compressing the products from their expanded condition into the container through the open side thereof;

applying retainer means through the container to retain the products compressed in the container;

releasing the compression from the products to permit them to expand but retained compressed by the applied retainer means,

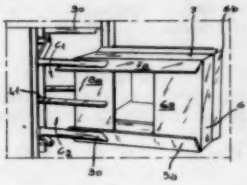
and removing the container with the retainer means from the side opening of the apparatus while products are retained compressed therein by the applied retainer means.

4,414,789

APPARATUS FOR TRANSFORMING BLANKS INTO CORRESPONDING CONTAINERS BY PARALLELEPIPED SHAPE

Domenico Pattarozzi, San Lazzaro di Savena, Italy, assignor to B.S.P. Packaging Systems Di Pattarozzi D. & C. S.A.S., Ozzano Emilia, Italy

Filed Mar. 16, 1981, Ser. No. 243,808
Claims priority, application Italy, Mar. 18, 1980, 3358 A/80
Int. Cl.³ B65B *43/24*
U.S. Cl. 53—566 **8 Claims**



1. Apparatus for transforming blanks into corresponding containers of parallelepiped shape, each of the said blanks being constituted by two superposed sheets provided with longitudinal creasings that define lateral walls of the corresponding container, as well as with transverse creasings and longitudinal slits, the latter being aligned with the longitudinal creasings so that the transverse creasings define flaps of the base and the cover of the said container, said apparatus comprising:

a magazine for holding a vertical stack of said blanks, said magazine having an open lower portion and including means for supporting the bottom of said stack;

a support structure for said magazine;

a carriage supported below a base of said magazine for movement in a downward direction parallel to a vertical axis of the magazine, between three consecutive stations, namely, a first station for removing the blank at the bottom of the said stack, a second station for forming the blank into a corresponding parallelepiped container and for filling it, and a third station for releasing the filled container;

means for moving said carriage between said stations;

first and second suction operated grasping means carried by said carriage, said first grasping means grasping a first portion of the wall of the lower sheet of the blank that remains parallel with the base of the magazine, and said second grasping means grasping a second portion of the wall of the lower sheet that subsequently forms a lateral wall of the container for removing said blank from said means for supporting the stack;

a first and a second arm pivotally connected one to the other at one common extremity and, at the other, to said carriage and said support structure, respectively, said first arm being positionable to contact the lateral wall held by the second grasping means in order to open the blank, in conjunction with the first grasping means, as the carriage travels from the first station to the second station, and said second arm having two parts placed at an angle, the first part being articulated to the first arm and being positioned, when the carriage is in the second station, both perpendicular to the lateral wall held by the first grasping means and in a position at the side of the remaining wall of the lower sheet;

third suction operated grasping means for grasping a lateral wall of the container carried by the said first part of the second arm and being actuatable prior to said carriage entering the second station;

first folding means for working on the opened blank positioned in the second station, at successive times, to fold a first base flap of the container perpendicular to the lateral wall held by the first grasping means, a second flap sym-

metrical with the first flap and, synchronously, the remaining flaps;

means for inserting into the opened blank provided with its base an orderly pile of articles;

second folding means for working on the said opened blank containing the said pile of articles for folding the cover flaps of the container made out of the said blank in the same sequence of folding operations as for the base flaps; and

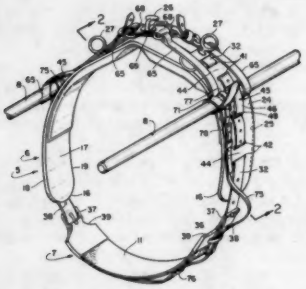
means, actuated concurrently with disengagement of the said first and third grasping means and with the displacement of the said carriage towards the said third station, for transferring the said filled container towards movement devices of a banding group.

4,414,790

HARNESS AND ATTACHMENT METHOD

Ronald W. Mitchell, 271 SE. 5th Ter., Pompano Beach, Fla. 33060

Filed Jun. 3, 1982, Ser. No. 384,471
Int. Cl.³ B68B *1/00*
U.S. Cl. 54—2 **22 Claims**



1. A harness adapted to be fitted to a horse and the shafts of a sulky comprising a girth comprising a first elongated member, a saddle comprising a second elongated member curvingly extending from a top down each side thereof, means for attaching said girth to said saddle, each side of said saddle having a first strap extending down the side thereof, means for attaching said first strap to said saddle, said first strap including a sulky shaft loop adapted to be fitted to one of said sulky shafts, said shaft loop extending outwardly from said saddle whereby said sulky shaft is positioned relative to said saddle at the approximate location of said shaft loop, a second strap connected to said saddle and extending down the side thereof substantially parallel to said first strap, said second strap being wrapped around said sulky shaft and connected to a buckle attached to said saddle at the approximate top thereof such that said sulky shaft is pulled upward.

4,414,791

RIDING SADDLE

Eugene A. Freeze, 18211 Lost Knife Clr., #302, Gaithersburg, Md. 20760

Filed Jul. 24, 1981, Ser. No. 286,478
Int. Cl.³ B68C *1/04*
U.S. Cl. 54—44 **23 Claims**

1. In a riding saddle of the English style suitable for competition riding, the combination of

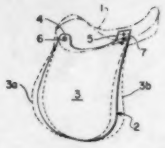
a seat structure;

two flaps each depending from a different side of the seat structure and each comprising

a flexible main body portion adapted to lie between the corresponding side of the horse and the rider's leg, and at least one upper portion; and

fastener means for each of the two flaps,

the fastener means for each flap including at least one releasable fastener and being constructed and arranged to secure at least one upper portion of the flap to the seat structure such that by releasing and reengaging the fastener means, with appropriate movement of the flap relative to the seat structure, the flap can be selectively secured and maintained in a forward position, appropri-



ate for jumping with shortened stirrups, a rearward position, appropriate for dressage with lengthened stirrups, and at least one intermediate position, appropriate for pleasure and trail riding,

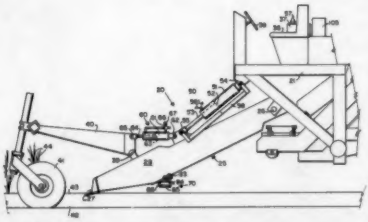
the main body portion of the flap being of such dimensions and configuration as to lie beneath the rider's leg when the flap is secured in any of said selected positions and the rider occupies a position in the saddle appropriate for the selected position.

4,414,792

HEIGHT CONTROL FOR AGRICULTURAL MACHINE

Darryl G. Bettencourt, Lodi, and Akos I. Szoboszlay, San Jose, both of Calif., assignors to Blackwelders, Rio Vista, Calif.

Filed Mar. 30, 1982, Ser. No. 363,642
Int. Cl.³ A01D *46/20*
U.S. Cl. 56—10.2 **8 Claims**



1. A method for keeping a machine member of an agricultural machine at a substantially constant height above a field during its movement through the field, said machine having a wheel-supported main frame and an auxiliary frame carrying said machine member and an ultrasonic transducer spaced at a constant distance away from said machine member, said auxiliary frame being supported by said main frame for generally vertical movement relative thereto, comprising:

setting said machine member at an initial position relative to the surface of said field, from which initial position the actual relative position of said machine member tends to diverge,

determining the position of said machine member relative to said main frame and generating an electrical signal corresponding thereto,

determining ultrasonically the height of said transducer above the field and generating an electrical signal corresponding thereto,

calculating, from the electrical signals of said two determining steps, the amount and direction of divergence of said

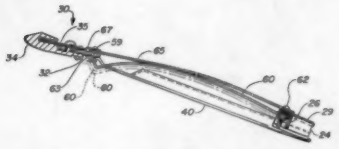
actual position of said machine member relative to the field surface from its initial position relative thereto and producing an electrical correction signal corresponding thereto, and moving the position of said auxiliary frame relative to said main frame in response to said correction signal, to bring said actual position toward conformity with said desired position.

4,414,793

FLEXIBLE CROP HARVESTING HEADER

Lawrence M. Halls, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 28, 1981, Ser. No. 306,635
Int. Cl.³ A01D *55/32*
U.S. Cl. 56—14.4 **11 Claims**



1. A flexible crop harvesting header, attachable to a crop harvesting machine to sever standing crop material and convey the severed crop material to the crop harvesting machine for further harvesting treatment, comprising:

a frame including a rearward connection means and a transverse front connection member;

a pair of spaced apart sidewalls supported by said frame and defining a width of said header;

a transverse cutterbar extending between said sidewalls forwardly of said frame for severing standing crop material, said cutterbar including an elongated primary support bar and a strip-like member positioned above said support bar;

a floor supported by said frame and forming a continuous surface over which severed crop can be conveyed toward said crop harvesting machine for further harvesting treatment, said floor terminating at a forward edge positioned between said strip-like member and said primary support bar;

a plurality of transversely spaced attachment ribs pivotally connected to said frame at said rearward connection area and connected to said primary support bar of said cutterbar to support said cutterbar from said frame for vertical movement relative to said frame and to provide a support for said floor to permit a flexible movement thereof with said cutterbar; and

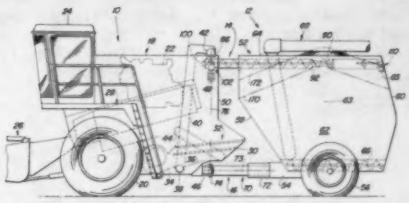
a plurality of transversely spaced leaf spring members connected to the lower side of said front connection member and projecting forwardly therefrom to terminate beneath the primary support bar of said cutterbar, said leaf spring members providing an uplifting, counterbalancing force to the weight of said cutterbar without restrictive connection therebetween to facilitate the vertical movement of said cutterbar in following the contour of the ground and the flexible movement of said floor with said cutterbar while providing the capability of optionally stacking additional leaf spring members for selectively varying the amount of uplifting, counterbalancing force applied to said cutterbar.

4,414,794

HINGE ARRANGEMENT FOR AN ARTICULATED COMBINE

Franz W. Riedinger, Horizontina, Brazil, assignor to Deere & Company, Moline, Ill.

Filed Apr. 23, 1982, Ser. No. 371,045
Int. Cl.³ B60D *1/00*
U.S. Cl. 56—16.6 **13 Claims**



1. An articulated harvester having front and rear bogies each having a body of substantial vertical extent and each having axles carrying a pair of laterally spaced wheels, said bogies being connected by a hinge arrangement having spaced apart upper and lower portions and permitting pivoting between the bodies about upright steering and fore-and-aft oscillation axes, said upper portion comprising an elongated link pivotally connected at its opposite ends to the respective front and rear bogies characterized in that:

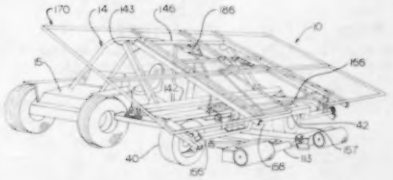
the pivot center of the connection of the upper link to the rear bogie is disposed substantially rearward of the axle of that bogie.

4,414,795

SHAKING APPARATUS

Theodore R. Johnstone, 28342 Avenue 11, Madera, Calif. 93637, and James P. Kaatz, 7 Hedge Ct., Apt. #1, Snyder, N.Y. 14226, assignors to Theodore R. Johnstone, Madera, Calif.; James P. Kaatz, Snyder, N.Y. and Edward T. Moon, Madera, Calif., a part interest

Filed Oct. 9, 1981, Ser. No. 310,239
Int. Cl.³ A01D *46/26, 46/00*
U.S. Cl. 56—328 TS **13 Claims**



1. A shaking apparatus comprising an arm oriented substantially along a longitudinal axis and adapted to be mounted on a vehicle for earth traversing movement therewith; means for mounting said arm on the vehicle including a pair of linear members secured on the arm on opposite sides of said longitudinal axis of the arm and connected to a means of support operable to permit said linear members independently to adjust to limited movement of the arm substantially about said longitudinal axis while supporting said arm; a pair of jaws mounted on the arm and movable relative to each other between an opened attitude in which said jaws are separated from each other and a closed attitude in which said jaws are juxtaposed relative to each other; means borne by the arm for moving the jaws between said opened and closed attitudes whereby the jaws in being moved to the closed attitude are operable to capture an object therebetween and automatically to adjust to

the angle of the object by contact of the jaws therewith to cause said limited movement about said longitudinal axis as permitted by said linar members; and means mounted on the apparatus for shaking the jaws to impart a shaking motion to an object captured between the jaws in the closed attitude.

4,414,796

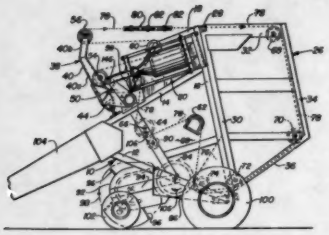
METHOD OF RELEASING APRON TENSION IN ROLL BALING MACHINES

Willis R. Campbell, Ephrata, Pa., assignor to Sperry Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 333,002, Dec. 21, 1981. This application Mar. 25, 1982, Ser. No. 361,647

Int. Cl.³ A01D *39/00*; B30B *5/06*

U.S. Cl. 56—341 **2 Claims**



1. In a roll baling machine having apron means defining an expandable bale chamber, said apron means moving from a first position to a second position during formation of a roll bale in said expandable bale chamber, air pressure spring means for maintaining tension in said apron means, said air pressure spring means including an air bag for containing air under pressure and a piston movable into said air bag to increase the air pressure therein, means for picking up crop material and for delivering said crop material to said expandable bale chamber, a method of releasing the tension in said apron means comprising:

reducing the air pressure in said air bag to a level where the tension in said apron means is relaxed to facilitate servicing of said apron means.

4,414,797

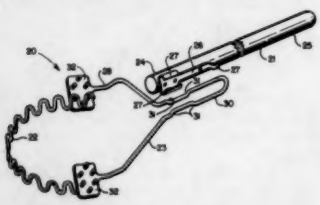
GARDENING TOOL

Gene R. Archer, 8225 Gale Rd., Rte. 1, Hebron, Ohio 43025

Filed Dec. 4, 1981, Ser. No. 327,556

Int. Cl.³ A01D *7/06*

U.S. Cl. 56—400.19 **9 Claims**



1. A gardening tool comprising:

a. a handle;

b. a comb element including attachemnt end sections on opposite sides of a working section of a sinuous serpentine plurality of projecting lobes constructed from a continuous member of elastic material, with the comb element supported by and attached to the handle only at the attachment end sections of the comb element, wherein the working section is characterized by having an elastic response when applied to the work in gardening activities; and

c. a yoke between the ends of the comb element and the handle, the yoke being constructed at one end with projecting lateral pins for engagement with projecting lobes of the attachment ends of the comb element and to attach to an end of the handle at the other end.

4,414,798

SPLICING APPARATUS FOR SPUN YARNS

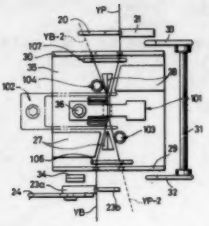
Isamu Matsui, Kyoto, and Hiroshi Mima, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 17, 1982, Ser. No. 359,041

Claims priority, application Japan, Mar. 18, 1981, 56-40033

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **6 Claims**



1. A splicing apparatus for spun yarns including a splicing member arranged at the center of the splicing apparatus and having a cylindrical splicing hole formed substantially at the center of the splicing member, a slit for insertion of the yarns into the splicing hole and a jet nozzle for jetting a compressed fluid into the splicing hole and opened to the splicing hole in the tangential direction, characterized in that control plates are located on both the outer sides of the splicing hole at such positions that certain side edges of the control plates respectively traverse a part of an opening of the splicing hole.

4,414,799

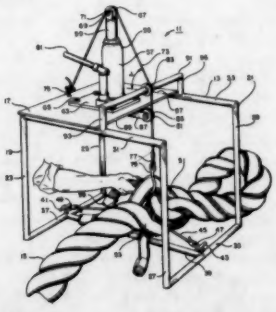
ROPE SPLICER

Louis Alexander, Rte. 3, Box 924, and Willie Brown, Jr., Rte. 1, Box 296, both of St. Martinville, La. 70582

Filed Apr. 12, 1982, Ser. No. 367,417

Int. Cl.³ B65H *69/06*

U.S. Cl. 57—22 **3 Claims**



1. A process for splicing a large diameter rope having a main elongated body with multiple strands and opposite free ends comprising the steps of:

passing a portion of the main body of said rope proximate a

selected free end thereof through a splicing frame, said frame defining a platform area supported by two support portions arranged at opposite extents of said platform area;

providing a flexible elongate member detachably engaged between said two support portions of said frame and a power stand separating means mounted on said platform area;

passing said flexible elongate member between a selected strand and the remaining rope strands of said rope portion and securing said member to said frame to bias said rope portion in a first direction with respect to said frame;

engaging said selected strand with said power strand separating means mounted on said platform and biasing said selected strand in a second opposite direction outwardly from said remaining rope strands to create an opening between said selected strand and said remaining strands;

passing a free end of one of said rope strands between said separated strand and the remaining strands;

relaxing said power strand separating means to thereby secure said free strand within said rope body; and

disengaging said flexible elongate member from said frame and moving said rope main body a selected distance through said frame for repeating said process with successive rope strands to effect a splice.

2. A portable, self-contained splicing frame for splicing strands of a large diameter rope, comprising:

a frame defining a platform area having two support portions arranged at opposite extents of said platform area;

a flexible elongate member detachably engaged between said two support portions of said frame and adapted to pass through said rope for securing the rope within the frame to bias said rope in a first direction with respect to said frame;

fluid power strand separating means mounted on said platform area on said frame for biasing said selected strand outwardly from said remaining strands of said rope, said power strand separating means including a fluid piston and a flexible line having a fixed end secured to said frame and an opposite free end with a coupling means carried thereon for engaging said selected strand of rope, said flexible line being operably associated with said piston cylinder of said power separating means whereby actuation of said power separating means retracts said coupling means to thereby bias said selected strand outwardly in a second opposite direction from said remaining rope strands secured within said frame; and

guide means on said frame for guiding and constraining said flexible elongate member during said biasing operation.

4,414,800

TWISTED YARN AND METHOD OF PRODUCING THE SAME

Takashi Nakayama; Seiichi Yamagata, both of Otsu, and Koji Kajita, Ohmihachiman, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,354

Claims priority, application Japan, Apr. 1, 1980, 55-42223; Oct. 31, 1980, 55-152332; Nov. 17, 1980, 55-160897

Int. Cl.³ D02G *3/28*

U.S. Cl. 57—236 **10 Claims**

1. A twisted yarn comprising at least two bundled sheaves of staple fibers, each said sheaf having a core having an initial twist of substantially zero and having wrapping fibers wrapped around said core, said sheaves being twisted upon each other, and said twisted yarn product having a coefficient of finishing twist utilization greater than 150%, said coefficient of finishing twist utilization (RF) being defined by the formula,

$$RF = \frac{STy}{SUTy} \times 100$$

where STy represets the strength of the twisted yarn and SUTy represents the strength of the yarn after detwisting the finishing twist of the yarn.

4,414,801

PROCESS FOR MAKING SPUN-LIKE YARN WITH VARIABLE DENIER FILAMENTS

Lawrence E. Blackmon, Foley, Ala.; John R. Dees, and Wayne T. Mowe, both of Pensacola, Fla., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 922,937, Jul. 10, 1978, abandoned. This application Feb. 9, 1981, Ser. No. 232,742

Int. Cl.³ D02G *1/02*; D01D *5/20, 5/30*

U.S. Cl. 57—288 **3 Claims**

1. A process for making a spun-like yarn comprising:

(a) providing a feed yarn comprising a plurality of continuous polyester filaments, each of said filaments having been prepared by the steps comprising;

(1) metering polyester polymer through a combined orifice to form molten polyester streams traveling in different extrusion speeds;

(2) converging and attenuating said molten polymer streams to form a combined stream having thick and thin regions repetitively along its length; and

(3) quenching said combined stream into a filament and withdrawing said plurality of filaments thereby forming said feed yarn;

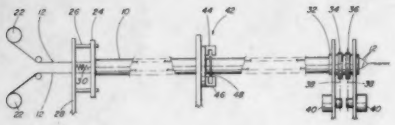
whereby each of said plurality of polyester filaments has a cross sectional area which varies repetitively from small values in thin regions to large values in thick regions along its length, said large values being at least 25% greater than said small values, said thick and thin regions being out of phase from filament to filament along length of said yarn;

(b) drawing while heating and false twisting said polyester feed yarn, said drawing being at a draw ratio selected to break a plurality of said filaments primarily in said thin regions.

4,414,802
APPARATUS FOR STRANDING WIRE

John N. Garner, Kingston; Jean M. Roberge, Pointe Claire, and Douglas G. Baxter, Kingston, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 30, 1982, Ser. No. 413,069
Int. Cl.[3] H01B *13/04*
U.S. Cl. 57—293 3 Claims



1. Apparatus for stranding wire comprising:

a single tube defining a single axial passage which provides at least two side-by-side feedpaths for wire along the passage, the passage shaped to prevent wires from moving from feedpath to feedpath, the tube being rotationally flexible about an axis to torsionally twist the tube and thus the passage around said axis from an untwisted position so as to cause the feedpaths to follow a helical path around the axis;

holding means to hold the tube against rotation about said axis at an upstream position of the tube;

wire twisting means at the downstream position of the tube to torsionally twist the tube, the twisting means rotatable with the downstream part of the tube, said feedpaths extending through the twisting means;

rotating means for rotating the twisting means together with the downstream part of the tube for a predetermined number of revolutions about the axis alternately in one direction and then the other;

direction changing means to change the direction of rotation of the twisting means after the twisting means has rotated the predetermined number of revolutions in each direction; and

resilient means associated with one of the ends of the tube to enable movement of said one end in the axial direction during twisting and untwisting of the tube.

4,414,803
FALSE TWISTING APPARATUS

Peter Dammann; Heinz Schippers, and Karl Bauer, all of Remscheid-Lennep, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 168,734, Jul. 14, 1980, Pat. No. 4,339,915. This application Jun. 12, 1981, Ser. No. 273,078
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928522; Jul. 9, 1980, 3025912
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.[3] D02G *1/08*
U.S. Cl. 57—340 8 Claims

1. A yarn false twisting apparatus characterized by the ability to adjust the ratio of twist to yarn advance speed, and comprising

a frame,

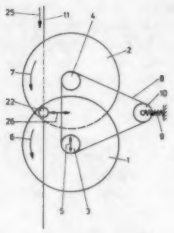
a pair of twist imparting discs, with each disc having a yarn engaging friction surface on one face thereof,

means mounting said discs to said frame for rotation about essentially parallel, spaced apart axes and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, substantially non-contacting relationship and define a twisting zone therebetween, and including means permitting selective relative movement of said discs along a direction generally perpendicular to their axes of rotation and parallel to the plane defined by such axes of rotation, and

drive means for rotating each of said discs in a common rotational direction and such that their respective yarn engaging friction surfaces run in different directions through said twisting zones,

whereby a yarn may be continuously moved through said twisting zone in a direction parallel to and laterally spaced from a line extending perpendicularly between said axes of rotation and so as to have twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces.

4. A yarn false twisting machine having a frame, a plurality of false twisting stations positioned in side-by-side relation along the length of said frame, and means for feeding a yarn through each of the false twisting stations, the improvement wherein said machine includes



a pair of parallel, spaced apart shafts rotatably mounted to said frame and extending horizontally therealong,

a pair of twist imparting discs mounted to respective ones of said shafts at each of said twisting stations, with the discs of each pair having a yarn engaging friction surface on one face thereof, and such that portions of the respective yarn engaging friction surfaces of each pair are disposed in opposing relationship and define a twisting zone therebetween,

means for rotating said shafts and each of said pairs of discs in a common rotational direction,

means for guiding the advancing yarn through said twisting zone of each of said pairs of discs and in a direction parallel to a line extending perpendicularly between said shafts,

whereby each yarn may be continuously advanced through a twisting zone while having twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces.

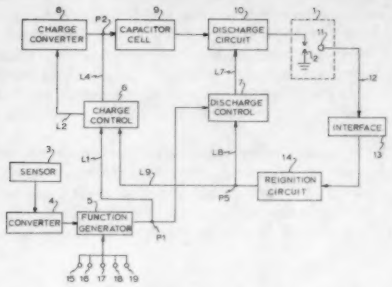
4,414,804
APPARATUS FOR IGNITION AND REIGNITION FOR A GAS TURBINE

Christian Menard, Maurepas; Daniel Marouby, Viroflay, and Alain Chollet, Paris, all of France, assignors to Automobiles Peugeot and Automobiles Citroen, both of Paris, France

Filed Dec. 24, 1981, Ser. No. 334,220
Claims priority, application France, Dec. 24, 1980, 80 27475
Int. Cl.[3] F02C *7/26, 7/262*
U.S. Cl. 60—39.141 9 Claims

1. In a system of spark ignition and reignition of fuel in a combustion chamber of a gas turbine, comprising a function generator (5) for generating a reference voltage as a function of at least the speed of the motor shaft of the turbine, charging means (8) for charging a capacitive cell, means responsive to the reference voltage for producing a regulating voltage, charge control means (6) responsive to said regulating voltage and a voltage indication of the voltage charge on said capacitive cell to control the maximum voltage charge on the cell by controlling said charging means, discharge means for discharging said capacitive cell to produce a spark across a spark gap,

means for deriving a control voltage in response to said reference voltage, and discharge control means (7) for controlling

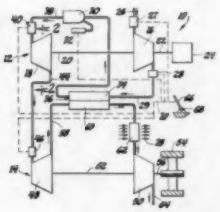


the frequency of discharge of said discharge means in response to said control voltage.

4,414,805
HYBRID GAS TURBINE ENGINE AND FLYWHEEL PROPULSION SYSTEM

Frank H. Walker, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1981, Ser. No. 325,335
Int. Cl.³ F02C *3/10*
U.S. Cl. 60—39.161 **5 Claims**

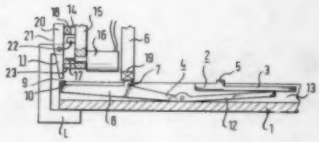


1. In combination with a subambient pressure cycle gas turbine engine having a peak power output level and a steady state power output level substantially less than said peak power output level and including a load shaft, a combustor, a primary compressor, a primary turbine drivingly connected to said primary compressor and to said load shaft, a secondary compressor, a secondary turbine drivingly connected to said secondary compressor, and duct means serially connecting said pimary compressor and said combustor and said primary turbine and said secodary turbine and said secondary compressor so that motive fluid generated in said combustor from combustion of fuel in air pressurized by said primary compressor may expand through respective ones of said primary and said secondary turbines to a subambient pressure level maintained by said secondary compressor and thereafter be compressed by the latter to ambient pressure, the combination comprising, a flywheel drivingly connected to said secondary compressor, and motive fluid expansion control means at said primary turbine and at said secondary turbine operative during engine operation at said steady state power output level to serially effect partial expansion of said motive fluid at said primary turbine whereby said steady state power output level is achieved at said load shaft and partial expansion at said secondary turbine whereby sufficient energy is extracted and directed to said secondary compressor to maintain said subambient pressure level and further operative during engine operation at said peak power output level to effect a substantially total expansion of said motive fluid at said primary turbine so that said peak power output level is achieved at said load shaft, said flywheel being operative to drive said secondary compressor during engine operation at said peak power output level thereby to maintain said subambient pressure level for said total motive fluid expansion.

4,414,806
NEEDLE SELECTION DEVICE FOR A KNITTING MACHINE

Reinhold Schimko, Aalen-Wasseralfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG, Westhausen, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,899
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138035; Jul. 13, 1982, 3226193
Int. Cl.³ D04B *7/00*
U.S. Cl. 66—75.2 **10 Claims**



1. A needle selection device for a knitting machine with a Jacquard mechanism in which the knitting needles are brought in a controlled manner with the aid of cam means on the knitting machine carriage into various positions in which they are inactive, or are active for knitting, for forming tuck loops and for the transfer of stitches, in which blocking levers corresponding in number to the number of needle channels and arranged in accordance with the gauge of the needle spacing are provided on mounting means extending over the length of the needle bed, in which on the carriage at each needle selection position there is provided a cam element for pivoting the associated blocking lever and an electromagnet which is controllable for needle selection and which is pivoted with a tripping pin for pivoting the blocking lever, and in which the knitting needles, either directly or by way of respective associated tilting levers, are held in pivoted positions selected for work by the respective blocking levers located in blocking positions.

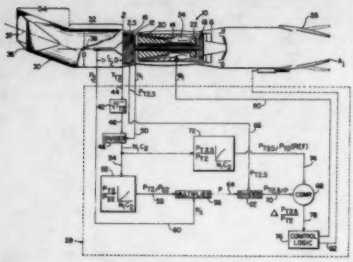
4,414,807
METHOD AND APPARATUS FOR CONTROLLING A GAS TURBINE ENGINE

Walter B. Kerr, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1980, Ser. No. 214,376
Int. Cl.³ F02K *1/17*; F02C *9/28*
U.S. Cl. 60—204 **5 Claims**

1. Control means for controlling a gas turbine engine during flight, said engine having a variable area exhaust nozzle and including a compressor and a turbine for driving said compressor and burner means disposed downstream of said compressor and upstream of said turbine for generating hot gases for driving said turbine, said engine having an inlet face plane, engine air inlet duct means disposed upstream of said engine for directing air into said engine, said duct means including a straight portion of substantially constant cylindrical cross section extending axially upstream from said inlet face plane for a distance equal to at least one half of said straight portion diameter, wherein said control means includes means responsive to the static pressure at a point in said inlet duct straight portion at least one-half duct diameter axially upstream of the inlet face plane for generating a first signal indicative of said static pressure, means responsive to the rotational speed of said compres-

sor and to the temperature of the air at said inlet face plane for calculating a corrected compressor speed, means responsive to said corrected compressor speed for generating a second signal indicative of the average total to static pressure ratio at the inlet face plane, means responsive to said first signal and said second signal for generating a third signal indicative of the average total pressure in said inlet face plane, and means responsive to said third signal and to a total pressure at an engine



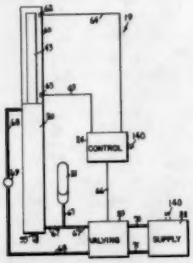
station downstream of said inlet face plane for generating a fourth signal indicative of a pressure ratio across said station, means responsive to said corrected compressor speed for generating a fifth signal indicative of a scheduled pressure ratio across said station, and, means responsive to the difference between said fourth and fifth signals for controlling either the flow of fuel to said burner means or the area of said exhaust nozzle.

4,414,808

HYDRAULIC ACTUATOR FOR WELL PUMPS

Terrence M. Benson, New Berlin, Wis., assignor to Oil & Sales Limited Partnership, Minneapolis, Minn.

Filed Nov. 10, 1980, Ser. No. 205,190
Int. Cl.³ F15B *1/02*
U.S. Cl. 60—372 **4 Claims**



2. Hydraulic apparatus for actuating a subsurface reciprocating pump, comprising, in combination:

I. a hydraulic actuator comprising,

(a) a vertically disposed motor cylinder having upper and lower ends,

(b) means, including a piston reciprocable in said cylinder dividing said cylinder into upper and lower closed chambers, the volumes of said chambers varying oppositely with movement of said piston, said piston having a lower working surface of area larger than its upper working surface so that said lower chamber is of larger volume than said upper chamber,

(c) a lift rod actuated by said piston, and

(d) upper and lower ports affording communication with said upper and lower chambers;

II. a hydraulic accumulator;

III. a source of hydraulic fluid under pressure including a pump and a receiver; and

IV. valving means operable between a first condition, in which fluid ingress from said pump is enabled to said lower port and said accumulator, and fluid egress to said receiver is enabled from said upper port, and a second condition in which said fluid egress to said receiver is prevented and fluid flow from said lower port and said pump to said accumulator and said upper port is enabled; and

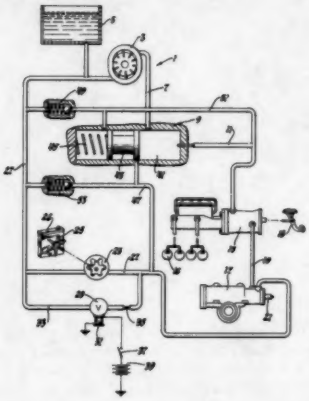
V. said piston being reciprocable through a range between upper and lower limits of travel, and means effective when said piston reaches said levels of travel to actuate said valving means between said first and second conditions, whereby to reverse the direction of movement of said piston.

4,414,809

HYDRAULIC POWER STEERING AND COOLING FAN DRIVE SYSTEM FOR VEHICLES

Darryl L. Burris, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1980, Ser. No. 201,513
Int. Cl.³ F15B *11/16*
U.S. Cl. 60—424 **2 Claims**



1. A hydraulic drive system in a vehicle for powering hydraulically driven vehicle accessories comprising a rotary hydraulic fan drive motor and a hydraulically powered steering gear hydraulically connected in series and with the steering gear having power priority over said motor, a fluid reservoir, hydraulic pump means for pumping fluid from said reservoir to said steering gear and to said hydraulic fan drive motor for powering said steering gear and fan drive motor, first fluid passage means hydraulically connecting the output of said hydraulic pump means to said steering gear, second fluid passage means for connecting the hydraulic output of said steering gear to said fan drive motor and from said motor to said reservoir for the continuous supply of pressure fluid for the hydraulic drive of said steering gear and said fan, flow control valve means hydraulically connected in said first passage means triggered when pressure demand from said steering gear drops below a predetermined pressure level for diverting a portion of the output of said hydraulic pump means to said fan drive motor in response to the predetermined buildup of fluid pressure in said accessory so that said fan drive motor is simultaneously driven by return fluid supplied from said steering gear and by bypass fluid from said control valve means.

4,414,810
FLUID RESERVOIR FOR A HYDRAULIC BRAKE SYSTEM

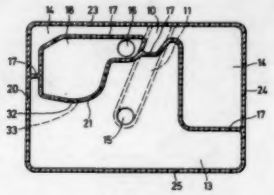
Hans-Dieter Reinartz, Frankfurt am Main, and Magdalene Buerger, Bischofsheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 18, 1981, Ser. No. 244,949

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3013990

Int. Cl.³ F15B 7/00

U.S. Cl. 60—535 **13 Claims**



1. A fluid reservoir for a master brake cylinder of a multi-circuit hydraulic brake system for an automotive vehicle comprising:

a reservoir housing including a lower section having two ports for connecting to said master cylinder and an upper section having a filler hole and two electric fluid level warning arrangements, said housing being subdivided into two separate compartments by a partition wall, each of said two compartments being disposed vertically below a different one of said two warning arrangements;

one of said two ports being in direct fluid connection with one of said two compartments; and

the other of said two ports being disposed in said one of said two compartments and being in direct fluid connection with only the other of said two compartments by a channel in said housing extending through said partition wall.

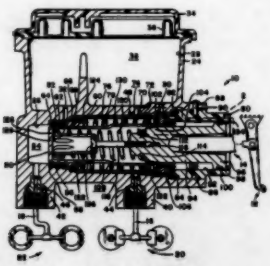
4,414,811
MASTER CYLINDER

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 19, 1981, Ser. No. 235,785

Int. Cl.³ B60T 11/28

U.S. Cl. 60—589 **6 Claims**



1. A master cylinder comprising a housing defining an elongated bore therein and a fluid reservoir communicating with said bore via a passage, a stepped piston movably received in said bore and cooperating with said housing to define a pair of pressure chambers, valve means circumscribing said piston and sealingly cooperating with said piston and housing for controlling fluid communication through said passage, said valve means including an annular valve member movably cooperating with a valve seat defined by a step on said housing bore to control fluid flow from one of said pair of pressure chambers to said reservoir via said passage, said annular valve member is reciprocably received in said bore, an annular lip seal received in said bore and engageable with said valve member and including a pair of yieldable concentric lips disposed away from said valve member and toward one of said pair of pressure chambers, said pair of lips sealingly and movably cooperating with said stepped piston and with said housing; an annular sealing member received in said bore and engageable with said valve member and including a pair of radially spaced oppositely disposed yieldable lips sealingly cooperating with said stepped piston and with said housing; the radially outer of said sealing member lips being disposed toward the other of said pressure chambers and cooperating with said housing, said sealing member defining an axially extending leg opposing said radially outer lip and movably cooperating with said stepped piston, said axially extending leg defining an axially extending groove communicating said other pressure chamber with the radially inner sealing member lip, said sealing member and said valve member cooperating to define an intermediate chamber communicating with said reservoir via said passage, said sealing member defining an axially extending annular protrusion projecitng toward and sealingly engageable with said valve member to divide said intermediate chamber into a radially outer portion communicating with said reservoir via said passage and a radially inner portion, said valve member defining passage means communicating said radially inner portion with said valve seat and said valve member communicating said radially inner portion with said reservoir when said valve member is disengaged from said valve seat, and resilient means for urging said valve member toward said one pressure chamber and into sealing engagement with said valve seat.

4,414,812
HOT AIR SOLAR ENGINE

John F. W. Parry, Westlake Village, Calif., assignor to R & D Associates, Marina del Rey, Calif.

Filed Apr. 30, 1981, Ser. No. 259,049

Int. Cl.³ F03G 7/02

U.S. Cl. 60—641.14 **22 Claims**

1. In a tracking solar collector and heat engine having a solar collector, radiation focusing means for concentrating and focusing sunlight on said solar collector, and positioning means for causing said radiation focusing means to be maintained in alignment with the position of the sun, said solar collector having a collector chamber exposed to said sunlight, the provision of an improved heat exchanger and engine for use with said solar collector comprising:

a recuperator chamber proximate to and in thermal communication with said collector chamber;

a compressor for drawing in working fluid of a first specific heat and compressing said working fluid to a first pressure;

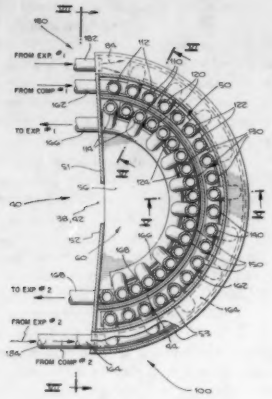
a two-stage heat exchanger having a fixed volume and comprising parallel conduits having recuperator and collector portions for carrying and heating said working fluid;

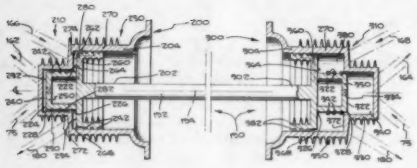
said two-stage heat exchanger having a recuperator stage within said recuperator chamber in which the recuperator portions of said parallel conduits are exposed to a recuperative heat source, and a collector stage within said collector chamber in which the collector portions of said parallel conduits are exposed to a solar radiation heat source;

said two-stage heat exchanger receiving working fluid compressed to a first specific heat and pressure from said compressor, heating said working fluid to a second, higher specific heat and pressure in said recuperator stage and from said solar radiation heat source in said collector stage;

an expander for receiving said working fluid at said second, higher specific heat and pressure from said two-stage heat

exchanger and causing said working fluid to perform useful work; and





exhaust heat duct means for delivering working fluid exhausted from said expander into thermal communication with said recuperator stage of the said two-stage heat exchanger.

4,414,813

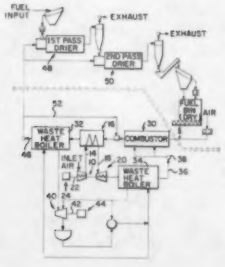
POWER GENERATOR SYSTEM

Hans J. Knapp, 4335 SW. Altadena Ave., Portland, Oreg. 97201

Filed Jun. 24, 1981, Ser. No. 277,026

Int. Cl.³ F01K *23/02, 27/02*

U.S. Cl. 60—655 **10 Claims**



1. An energy conversion system for production of electric power, comprising:

a combustion unit for burning biomass fuel to produce hot combustion flue gases;

a high temperature gas-to-gas heat exchanger through which a gaseous heat exchange fluid essentially free of particulate matter is passed and through which the hot combustion flue gases from the combustion unit are directed to heat the gaseous heat exchange fluid;

a gas turbine directly connected to an electrical generator, the turbine including a compressor section for compressing the gaseous heat exchange fluid and a power section for powering the electrical generator;

means for directing the compressed gaseous heat exchange fluid through the high temperature gas-to-gas heat exchanger and then directing the heated heat exchange fluid through the power section of the turbine;

a steam generator;

means to deliver the hot combustion flue gases, after their passage through the gas-to-gas heat exchanger, to the steam generator;

one or more dryer units for removing moisture from the biomass prior to combustion; and

means to direct residual heat energy contained in the combustion flue gases, after their passage through the steam generator, to the dryer units to aid in drying of the biomass fuel.

4,414,814

SOLAR HEAT ENGINES

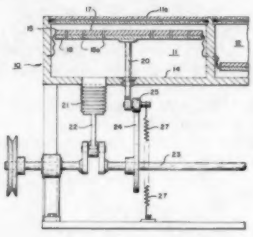
Eugene W. White, R.D. #2, Box 182, Rossiter, Pa. 15772

Continuation-in-part of Ser. No. 181,790, Aug. 27, 1980, Pat. No. 4,356,697. This application May 28, 1981, Ser. No. 267,902

The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—682 **11 Claims**



1. A solar pressure oscillation generation device comprising a chamber having two spaced apart walls, means on one wall transmitting sunlight to provide heat at internal absorbing surface within the chamber, means on the other of said walls continuously cooling said other wall, a heat absorbing solar panel movable between said walls, means alternating said solar panel, back and forth between said walls whereby a gas contained in said chamber is alternately heated and cooled thereby causing said gas to undergo alternate expansion and contraction.

4,414,815

GAS TURBINE WITH ATOMIZER NOZZLE

Oswald Conrad, Fellbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,439

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930055

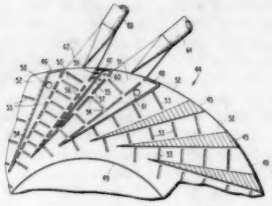
Int. Cl.³ F02C *7/22*

U.S. Cl. 60—726 **4 Claims**

1. A gas turbine which includes an air compressor means for supplying compressed air to a combustion chamber, at least one atomizer nozzle means for supplying fuel to the combustion chamber, the air compressor means includes a secondary guide vane set having a plurality of ducts, means are provided at at least one of said plurality of ducts for enabling a boundary layer bleed off, and in that means are provided for communi-

cating said at least one duct of the secondary guide vane set with the atomizer nozzle means so as to enable a direct supplying of high pressure compressed air to said atomizer nozzle means,

the secondary guide vane set includes a plurality of spaced solid blades and a pair of hollow blades defining said at least one duct, said blades being arranged between two annular shrouds, and in that means are provided for intensifying the bleed-off at said at least one duct, characterized in that



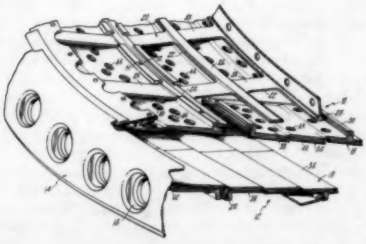
said intensifying means includes a plurality of slots provided in said annular shrouds communicating with collecting chambers, and a plurality of further slots provided in said hollow blades and terminating in an interior space of the respective hollow blades, bore means are provided in the respective hollow blades for communicating the interior space with the collecting chambers, and in that means are provided for communicating the collecting chambers with a low pressure area of the gas turbine.

4,414,816

COMBUSTOR LINER CONSTRUCTION

Harold M. Craig, West Hartford; Walter B. Wagner, Bolton, and William J. Strock, Vernon, all of Conn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 2, 1980, Ser. No. 136,652
Int. Cl.³ F23R *3/60*
U.S. Cl. 60—757 **4 Claims**



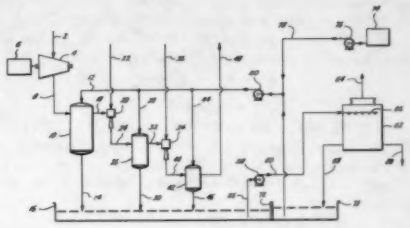
1. A combustor liner for a gas turbine engine disposed in a cavity supplied with cooling air, said liner having a lattice type frame in said cavity, a plurality of rectangularly shaped segments supported to said frame and stacked in a circumferential and axial direction and being contoured to define the combustion chamber and being between the combustion products and said frame, means for cooling said segments, means for permitting thermal expansion of said segments in a relatively unconstrained movement whereby the hoop stresses are substantially eliminated, means for securing said segments to said frame for defining a generally annularly shaped combustion zone.

4,414,817

PURIFYING GEOTHERMAL STEAM

Robert T. Jernigan, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 27, 1981, Ser. No. 325,472
Int. Cl.³ F03G *7/00*
U.S. Cl. 60—641.2 **3 Claims**



1. A process for using geothermal steam containing H_2S to generate electricity with subsequent purification of the residual steam comprising

(A) condensing said residual steam with an aqueous solution containing a ferric chelate in a condensing zone under temperature sufficiently low to convert said steam and said solution into an aqueous solution containing H_2S and said ferric chelate;

(B) converting said aqueous H_2S solution to an aqueous solution containing free sulfur and ferrous chelate by contacting said aqueous H_2S solution with an aqueous solution of ferric chelate containing a sufficient amount of ferric chelate to completely oxidize the H_2S to sulfur;

(C) converting said ferrous chelate solution with air in a cooling zone into an aqueous solution containing ferric chelate;

(D) continuously adding ferric chelate to said ferric chelate solution to maintain said sufficient amount; and

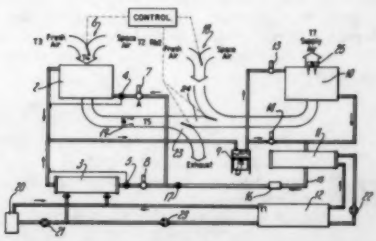
(E) recycling said ferric chelate solution back to said condensing zone.

4,414,818

ENVIRONMENTAL CONTROL SYSTEM

Alan M. Turbard, Leighton Buzzard, and Peter N. Foley, Basingstoke, both of England, assignors to Borg-Warner Ltd., Letchworth, England

Filed Mar. 2, 1982, Ser. No. 354,130
Claims priority, application United Kingdom, Mar. 5, 1981, 8107003
Int. Cl.³ F25D *17/04*; G05D *23/00*
U.S. Cl. 62—176.1 **5 Claims**



1. An environmental control system comprising in combination: a non-reverse cycle heat pump, said heat pump including means for selectively extracting heat from a plurality of different heat sources, at least one of said sources being an airstream,

said means including an evaporator for extracting heat energy from an air stream through which recirculated space air, fresh air, or mixtures thereof may be circulated; means for selectively rejecting the extracted heat into an air stream to provide heated environmental space air; means for recovering at least a portion of the rejected heat and utilizing the same to increase the heat content of at least one of said heat sources; and control means for selecting the heat sources and uses of the extracted heat in accordance with prevailing conditions and arranged so that, when available, heat is preferentially extracted from said air-stream source, said control means including means for selecting fresh air, recirculated space air, or a

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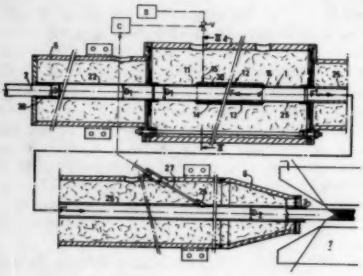
4,414,819

TEMPORARILY RIGIDIFYING SOFT MATERIALS

Francois Contal, Grenoble, and Bernard Boyer, Sassenage, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Apr. 27, 1982, Ser. No. 372,313
Claims priority, application France, May 8, 1981, 81 09151
Int. Cl.³ F25B *41/04*
U.S. Cl. 62—222 **2 Claims**



1. An apparatus for temporarily rendering rigid a product of soft material of very elongated form before said product reaches a processing station, said apparatus comprising a tunnel of elongated shape, the tunnel comprising a refrigerating duct having an internal transverse outline matching with radial clearance an outer transverse configuration of said product from an entrance end to an exit end of the tunnel, the duct comprising an upstream section and a downstream section with respect to the direction of travel of said product, the upstream section being provided with a heat exchanger, the heat exchanger comprising conduit means connected to a source of liquid nitrogen and opening into the duct upstream section, the internal transverse outline of the duct upstream section having greater dimensions than those of the internal transverse outline of the duct downstream section, whereby a comparatively high rate of flow of vaporized nitrogen travels in counterflow with respect to the product, whereas a comparatively small rate of flow of vaporized nitrogen flows equidirectionally with respect to the product.

4,414,820

ELECTRICAL CIRCUIT AND METHOD OF CONTROLLING SUCH

George E. Morris, Sterling, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 16, 1982, Ser. No. 349,377
Int. Cl.³ F25B *27/00*
U.S. Cl. 62—226 **14 Claims**

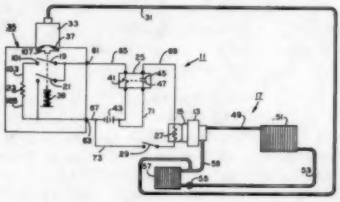
1. An electrical circuit for controlling the operation of a refrigerant compressor having a suction side and a discharge side connected in an automotive type air conditioning system comprising:

a battery;

a clutch device for coupling in driving relation with the compressor to effect the operation thereof in the system and including coil means adapted for energization across said battery to effect the coupling of said clutch device in the driving relation thereof with the compressor;

a relay device including at least one set of contact means operable generally between a closed position and an open position for connecting and disconnecting said coil means across said battery, respectively, and another coil means adapted for energization across said battery to effect the operation of said at least one contact means set; and

a control device including a pair of switch elements actuated between an open position and a closed position with said switch elements being connected in parallel with each other and in series with said another coil means of said relay device and said battery, respectively, diaphragm means subjected to fluid pressure on the suction side of the compressor and movable for actuating said switch elements, respectively, said diaphragm means being initially movable in response to the fluid pressure of a preselected value on the suction side of the compressor acting on said diaphragm means to actuate one of said switch elements to its closed position connecting said another coil means across said battery, a resistor placed in series with said another coil means upon the closure of said one switch element and having a preselected resistance value to obviate the operation of said at least one contact means set to the closed position thereof by said another coil means when it is connected across said battery upon the closure



of the one switch element, said diaphragm means being thereafter further movable in response to an increase in the fluid pressure on the suction side of the compressor to another preselected value greater than the first named preselected value to actuate the other of said switch elements to its closed position energizing said another coil means across said battery in shunt relation with said resistor and said one switch element in its closed position and said at least one contact means set being operated to the closed position thereof energizing said first named coil means of said clutch device across said battery thereby to effect the coupling of said clutch device in the driving relation thereof with the compressor when said another coil means of said relay device is energized upon the closure of said other switch element, and resilient means operable generally for opposing the switch element actuating movement of said diaphragm, said resilient means being initially operable to return other switch element to its open position replacing said another coil means in series relation with said resistor and said one switch element when the fluid pressure on the suction side of said compressor acting on said diaphragm means is reduced below the another preselected value with the preselected resistance value of said resistor acting to maintain said another coil means energized across said battery upon the operation of said other switch means to its open position and said resilient means being thereafter further operable to return said one switch means to its open position to effect the deenergization of said resistor and said another coil means across said battery when the fluid pressure on the suction side of the compressor acting on said dia-

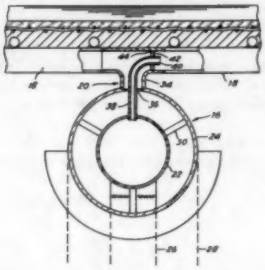
phragm means is reduced below the first named preselected value thereby to effect the operation of said at least one contact means set to the open position thereof interrupting the energization of said first named coil means across said battery and the coupling relation of said clutch means with the compressor.

4,414,821

ICE RINK REFRIGERANT DISTRIBUTION MEANS

Li G. Jing, Block C8-31/F, Causeway Centre, Hong Kong

Filed Jul. 6, 1982, Ser. No. 395,855
Int. Cl.³ A63C *19/10*
U.S. Cl. 62—235 **17 Claims**



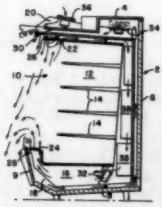
1. Refrigerant distribution means for ice rink refrigeration apparatus, comprising a supply pipe for the supply of liquid refrigerant; a plurality of rink pipes connected with the supply pipe to receive liquid refrigerant therefrom and positioned beneath the ice rink to effect cooling by refrigerant vaporization; and a collection pipe connected with the rink pipes to collect vaporised or partially vaporised refrigerant, characterised in that the supply and collection pipes are arranged one extending longitudinally within the other to form a common header for the rink pipes and in the provision of respective T-shaped means for the supply and return connections of each rink pipe with the common header.

4,414,822

REFRIGERATED DISPLAY CASE WITH COLLIDING BAND AIR DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 70,882, Aug. 29, 1979, Pat. No. 4,341,081, and Ser. No. 11,804, Feb. 14, 1979, abandoned. This application Jan. 21, 1981, Ser. No. 226,769
Int. Cl.³ A47F *3/04*
U.S. Cl. 62—256 **10 Claims**



1. A refrigerated display case comprising:

a cabinet having a display space and an access opening permitting access to the interior of said display space;

an inner air conduit passing around said display space and having a first air outlet adjacent one side of said access opening and a first air inlet adjacent an opposite side of said access opening;

first air circulating means for circulating air through said inner air conduit and across said access opening between said first outlet and first inlet to establish a primary air band and a primary air cutrain in a refrigeration mode;

refrigeration means for cooling air passing through said inner air conduit during the refrigeration cycle of operation of said display case and being capable of being shut off during a defrost cycle of operation;

a secondary air conduit passing around said cabinet adjacent to said inner air conduit but outwardly therefrom and having a second air outlet adjacent one side of said access opening and a second air inlet located adjacent an opposite side said access opening;

second air circulating means for circulating air through said secondary air conduit and across said access opening between said second oulet and second inlet to establish a secondary air band with a secondary air curtain in the refrigeration mode; and

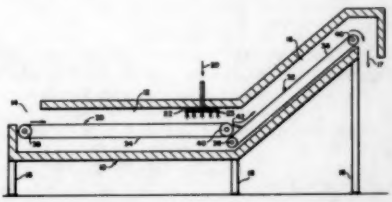
defrost cycle control means, including means for reversing the air flow direction of said first air circulating means during a defrost cycle, and means for maintaining the air flow direction of said second air circulating means continuously in the same direction during both refrigeration and defrost cycles, the first inlet region and second outlet region being so aligned as to cause primary band air flowing out of the first inlet to collide with secondary band air flowing out of the second outlet during a defrost cycle, said secondary band air flow substantially reversing the primary band air flow direction, whereby a substantial portion of said primary band air flows outside the display case adjacent the inlet region thereof and adjacent the front of the display case.

4,414,823

CRYOGENIC FREEZER

Thomas E. McWhorter, Whitehall, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 130,905, Mar. 17, 1980, Pat. No. 4,312,156. This application Jan. 21, 1982, Ser. No. 341,351
Int. Cl.³ F25D *23/02*
U.S. Cl. 62—266 **8 Claims**



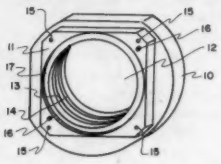
1. An apparatus for cryogenically freezing an article which comprises, (a) a housing including an entry port at one end thereof, a freezing station, an exit tunnel, and an exit port at the other end thereof and communicating between the exit tunnel and the exterior of the housing, said freezing station positioned intermediate said entry port and said exit tunnel, said exit tunnel extending from said freezing station upwardly to said exit port, (b) cryogen inlet means for introducing a cryogen into said freezing station, and (c) means for transporting the article to be frozen sequentially from the entry port, through the freezing station and the exit tunnel to the exit port, said freezing station being maintained at a cryogenic temperature and said exit port being at a sufficiently greater vertical elevation than said entry port and said freezing station to establish countercurrent flow of the cryogen relative to the movement of the article from said cryogen inlet means to said entry port.

4,414,824

CRYOGENIC COOLER ADAPTER PLATE

Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 429,655
Int. Cl.³ F25D 19/00
U.S. Cl. 62—295 3 Claims



1. An adapter plate for mounting a cryogenic cooler having a mounting flange to either of two different thermal sights, wherein one sight has a mounting wall with a first round hole extending part way through said wall, a generally rectangular hole concentric with but larger than said round hole and extending an additional part through said wall, and a second round hole concentric with the other holes but larger than them and extending the remaining part through said wall, and with screw holes in said wall and alignment pin holes at the bottom of said generally rectangular hole; wherein the other sight has a mounting wall with a large round hole therethrough, with small screw clearance holes therethrough, and with large and small alignment pin blind holes in one surface thereof, wherein said adapter plate includes:

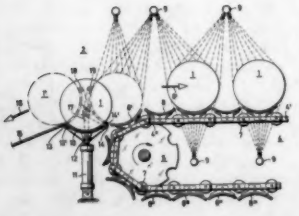
a generally discoid plate having first and second opposite faces and a central round hole through said plate, wherein said first has a generally rectangular embossment thereon concentric with said central round hole, said embossment has a plurality of screw holes in its surface and at least one alignment pin extending from said surface, and said central round opening has parallel seal grooves in its perifiry and wherein said second face has at least one large alignment pin and least one small alignment pin extending therefrom and a plurality of screw holes therein, and means for retaining said plate in either sight, wherein said central round opening corresponds in size to said cooler mounting flange.

4,414,825

COOLING DEVICE FOR CARBON ANODES

Joachim Gittelbauer, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,400
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127909
Int. Cl.³ F25D 17/02
U.S. Cl. 62—374 15 Claims



1. A mechanism for cooling molded bodies having moldable masses such as carbon anodes comprising in combination:

a conveyor for gently carrying heated moldable bodies through a cooling zone having a plurality of support stations;

a concave receiving shaped transfer means at the receiving end of the conveyor for receiving individual bodies and gently transferring them to the individual support stations;

a concave shaped grate-like support element shaped to provide surface shape retaining support to the moldable bodies for each of the support stations;

cooling means positioned for directing a cooling medium over the bodies on the conveyor during travel through the cooling zone;

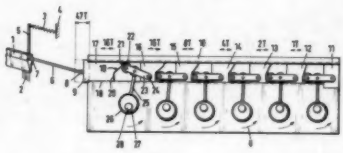
and a discharge transfer means at the delivery end of the conveyor gently receiving the bodies.

4,414,826

SUMMATION DRIVE FOR CONTROLLING SHOGGING IN A WARP KNITTING MACHINE

Kresimir Mišta, Obertshausen, and Norbert Englert, Schaafheim, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinfabrik, GmbH, Obertshausen, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,730
Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117683
Int. Cl.³ D04B 23/00
U.S. Cl. 66—207 11 Claims



1. A summing arrangement for controlling the shogging movement of a guide bar of a warp knitting machine, comprising:

a plurality of ordered elements each having at least one curved face and each being mounted in said arrangement to allow a variation in the spacing between each; said ordered elements comprising one terminal fixed element, the remaining elements being movable in a longitudinally reciprocatable manner, the most distant face of the movable element most distance from said fixed element being operatively couplable to said guide bar for moving said guide bar in a longitudinally reciprocatable manner and

a plurality of adjustable rolling means, a different corresponding one being engaged between each adjacent pair of said elements for rolling upon and pushing at least one of said elements at its curved face.

4,414,827

COLLAPSIBLE KNITTING MACHINE

Yoshimori Sugita, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 13, 1982, Ser. No. 407,958
Claims priority, application Japan, Aug. 31, 1981, 56-137354
Int. Cl.³ D04B 7/00
U.S. Cl. 66—60 H 3 Claims

1. A collapsible flat bed knitting machine, comprising;

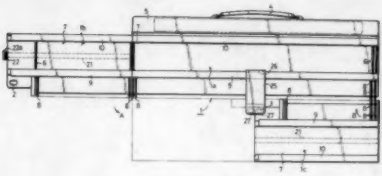
a needle bed including a major part and at least one minor part;

a plurality of sinker elements arranged in parallel with each other and at regular intervals on the front edge of said needle bed in the longitudinal direction thereof;

a plurality of latch needles aligned in a row in said needle bed and positioned alternately between said sinker elements;

said latch needles being slidable in a direction perpendicular to the longitudinal direction of said needle bed; and

connector means for connecting said minor part to a longitudinal end of said major part to fold said minor part in a horizontal plane, said connector means including first and second connect members mounted on the each front portion of said major and minor parts, and a vertical axis located near the front edges of said sinker elements to joint the both connect members pivotally.

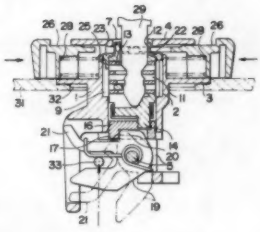


4,414,828

LOCKING APPARATUS FOR COMPARTMENT DOOR OPERATED BY A KEY

Toshikazu Takinami; Masao Horaguchi, both of Toyota, and Keizo Suzuki, Inazawa, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha Tokai-Rika-Denki-Seisaku-sho, Toyota, Japan

Filed Jun. 10, 1981, Ser. No. 272,279
Claims priority, application Japan, Jun. 18, 1980, 55-85442[U]
Int. Cl.³ E05B *63/12, 65/06;* E05C *3/10, 3/26*
U.S. Cl. 70—84 **9 Claims**



1. A locking apparatus for a compartment door operated by a key comprising:

an outer cylinder fixed in the compartment door;

a rotor inserted into said cylinder so as to freely rotate between a locking position and a door opening position substantially coaxially with said cylinder, one end of said rotor being exposed toward the outside of the compartment door, and said rotor being provided with a hole opening at said one end thereof so as to be available for inserting the key from the outside of the door;

a plurality of locking plates which are inserted into said rotor radially slidably and are spaced apart from each other in the axial direction of said rotor;

one or more engaging plates which are inserted into said rotor radially slidably;

a ring surrounding said rotor and independently rotatable with respect to said rotor;

a lip projected from said ring in the axial direction of said rotor and engageable with said engaging plate;

operating means for rotating said ring; and

engaging means which maintains the compartment door closed and is released by said rotor at the door-opening position;

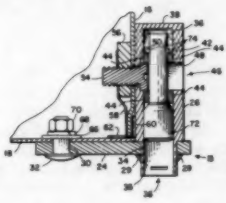
whereby said locking plates project radially out of said rotor to engage said outer cylinder at the locking position of said rotor before the key is inserted into said hole, the key pulls said locking plates into said rotor to release said locking plates from said cylinder when the key is inserted into the hole, said rotor is rotated from the locking position to a releasing position between the locking position and the door-opening position, at this releasing position said engaging plates project radially out of the rotor to engage with said lip when the key is pulled out of the hole so that the rotor is operable by said operating means.

4,414,829

LOCKING DEVICE FOR AN ELECTRIC METER BOX

Anker J. Nielsen, Jr., Holden, and Richard E. Hoyt, Worcester, both of Mass., assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 9, 1981, Ser. No. 223,570
Int. Cl.³ B65D *55/14;* E05B *65/52;* E05C *5/04, 13/02*
U.S. Cl. 70—160 **1 Claim**



1. A locking device for an electric meter box comprising:

(a) an L-shaped lock housing having a first leg adapted to be securely fixed to the hinged front cover of the meter box, and having a second leg extending substantially perpendicular to said first leg and adapted to be positioned flush against and detachably fastened directly to a side wall of the meter box to lock the front cover in the closed position;

(b) said second leg having an axial bore opening only at the front end of said second leg, said second leg also having a transverse bore intersecting said axial bore, said transverse bore opening at both sides of said second leg;

(c) fastener means inserted into said second leg transverse bore for detachably fastening said second leg directly to the meter box side wall;

(d) said second leg being sized and shaped to accommodate the insertion of a bolt-type lock into said second leg axial bore, said bolt-type lock having a barrel, a plunger and locking balls, said bolt-type lock, when in its locked position with its locking balls extended, being fixed against withdrawal from said axial bore and fixing said fastener means against withdrawal from said transverse bore, said bolt-type lock, when in its unlocked position with its locking balls retracted, being removable from said axial bore and permitting said fastener means to be removed from said transverse bore;

(e) said inserted fastener means having a head portion which, when said bolt-type lock is inserted into said second leg axial bore is completely blocked by said bolt-type lock from exterior access;

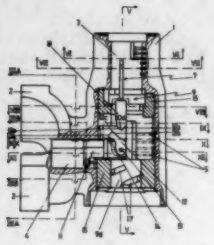
(f) said second leg axial bore having a reduced diameter portion spaced from its closed end, said reduced diameter portion being sized and located to engage the extended locking balls of said bolt-type lock to fix and bolt-type lock in said second leg axial bore to block said inserted fastener means; and

(g) bushing means forming said reduced diameter portion, said bushing means fitted and fixed in said second leg axial bore, said bushing means defining part of said second leg transverse bore, said bushing means retained in said second leg axial bore by said fastener means.

4,414,830
LOCKING DEVICE FOR MOTOR VEHICLES

Guiseppe A. Maiocco, Druento, Italy, assignor to Champion Spark Plug Italiana S.p.A., Druento, Italy

Filed Nov. 19, 1981, Ser. No. 323,065
Claims priority, application Italy, Nov. 28, 1980, 68820 A/80
Int. Cl.³ B60R 25/02
U.S. Cl. 70—252 5 Claims



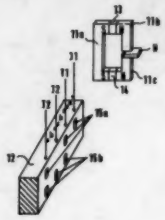
1. In a key-operated steering shaft locking device for a motor vehicle, the device comprising a rotatable lock cylinder having a key slot, a spring and a latch movable from a position wherein an associated steering shaft is locked to a position wherein the shaft is unlocked, the latch being operatively associated with the cylinder so that rotation of the latter causes axial movement of the former perpendicular to the axis of rotation of the cylinder from the locked to the unlocked position and also being operatively associated so that the spring urges the latch toward the locked position, the improvement wherein the locking device further comprises means including a rocker arm pinned for rotational movement between a first position wherein a portion of said arm extends into the key slot of the cylinder and said means is ineffective to lock the latch in the position where the shaft is unlocked and a second position wherein said arm does not extend into the key slot and said means is effective to lock the latch in the position where the shaft is unlocked, and means operatively associated with said rocker arm and the spring so that, when the latch is locked in the position where the shaft is unlocked, the spring urges said rocker arm toward the first position, whereby, a key inserted in the key slot moves said rocker arm to the second position and said last-named means urges said rocker arm toward the first position when the latch is locked in the position where the shaft is unlocked.

4,414,831
KEY-OPERATED LOCK

B. R. Perkut, Jochbergstr. 10, Benediktbeuern, Fed. Rep. of Germany (D-8174)

PCT No. PCT/DE80/00120, § 371 Date Apr. 15, 1981, § 102(e) Date Apr. 15, 1981, PCT Pub. No. WO81/00586, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 14, 1980, Ser. No. 253,529
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933453
Int. Cl.³ E05B 47/00, 49/00
U.S. Cl. 70—276 22 Claims

1. Key-operated lock, comprising a reading head with a Hall generator, the magnetic inductance of said Hall generator varying in dependence upon the position of the key provided along its axis with successively arranged for magnetically readable data locations, wherein the signal voltage of said key, which depends upon the momentary value of the inductance is compared by a receiver circuit with stored data as set, the receiver circuit, in case of matching data actuating the mechanical latching device of the lock, characterized by each magnetically readable data location (I1, I2) of the key forming a minimum bivalent (dual) code and by each data location (I, being succeeded by a magnetically readable time-pulse plane (T) which controls the processing in the receiver circuit of that

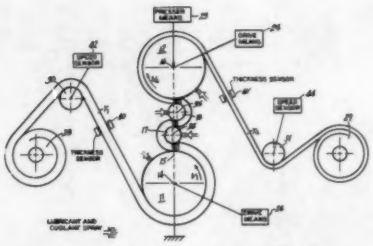


data location previously read out by the Hall generator in the reading head.

4,414,832
START-UP AND STEADY STATE PROCESS CONTROL FOR COOPERATIVE ROLLING

William L. Brenneman, Cheshire; Gary L. Ungarean, Woodbridge; Phillip A. Chatfield, West Haven; Michael J. Pryor, Woodbridge, and Joseph Winter, New Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 11, 1981, Ser. No. 301,331
Int. Cl.³ B21B 37/12
U.S. Cl. 72—8 12 Claims



1. An apparatus for operating a rolling mill to produce a continuous strip material having a substantially constant final thickness, said apparatus comprising:

said rolling mill having at least two rolls rotating at different speeds, said speeds defining a roll speed ratio;

said strip material entering said mill at a first speed, passing through at least one roll bite formed by said at least two rolls, and exiting said mill at a second speed;

a strip speed ratio being defined by the ratio of said first strip speed to said second strip speed;

means for detecting the thickness of said strip material entering said mill;

means for controlling said roll speed ratio as a function of said detected strip material thickness;

means for producing a compressive force having a magnitude between said at least two rolls; and

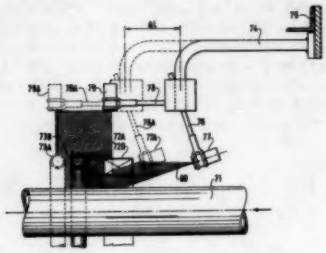
means for controlling the magnitude of said compressive force in response to said strip speed ratio so that said speed ratios are maintained substantially equal,

whereby the amount of off-gage strip material produced during start-up of said mill is reduced and process stability and gage control during steady state operation of said mill is enhanced by maintaining said speed ratios substantially equal.

4,414,833
METHOD AND APPARATUS FOR BENDING A LONG METAL MEMBER

Jacques Nicolas, Bondues, and Paul Lenglet, Bievres, both of France, assignors to Societe Anonyme dite: Stein Industrie, Velizy-Villacoublay, France

Filed Aug. 5, 1981, Ser. No. 290,044
Claims priority, application France, Aug. 5, 1980, 80 17297; Jan. 14, 1981, 81 00539
Int. Cl.³ B21D 7/12, 7/16
U.S. Cl. 72—13 20 Claims



1. In a method of bending a long metal member of constant cross-section about a center of curvature by locally heating a narrow zone on the periphery of said member by means of a heating collar which surrounds said zone, said collar being spaced from the member by a radial gap, exerting thrust on one end of the member and supporting its other end by means of a pivoting arm, the improvement comprising:

keeping the temperature of the heated zone on the periphery of the member substantially constant by detecting the temperature of said zone or the radial gap which separates the heating collar from the periphery at said zone, at at least two points about said periphery, one of said points being nearest to the center of curvature and the other being furthest from the center of curvature, and

increasing or reducing the input of heat at said one or said other of said points according to whether the detected temperature is lower or higher at said one point or said other point compared with a nominal value which corresponds to a uniform temperature of the heated zone around the periphery.

4,414,834
METHOD FOR EXPANDING TUBULAR BLANKS

Nelson R. Gratzer, Liverpool, and William E. Wright, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 231,641, Feb. 5, 1981. This application Jan. 26, 1983, Ser. No. 461,091
Int. Cl.³ B21D 26/04
U.S. Cl. 72—58 4 Claims

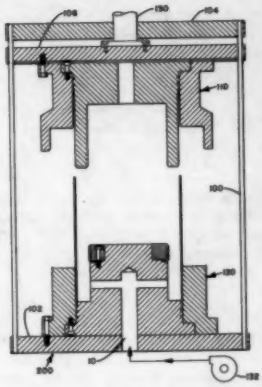
1. A method of expanding a selected portion of a generally tubular workpiece which comprises the steps of:

mounting a first die and a second die in relative sliding engagement, said first die including supporting means for the workpiece and a cylindrical center portion projecting within and spaced from the workpiece and said second die including an annular projection portion sized to mate with the cylindrical center portion to form a seal therewith and a bleed opening to allow fluid in the center space defined by the annular projection portion to bleed therefrom;

placing the workpiece in the first die such that the supporting means secures the workpiece in position forming a seal between the workpiece and the first die, such that the center projection portion is located within the workpiece and such that the second die is not in contact with the first die or the workpiece;

filling the interior of the workpiece with a non-compressible fluid until the fluid overflows and all compressible gases are displaced;

displacing the second die towards the first die to engage the end of the workpiece to apply a compressive force to the workpiece, to have the annular projection portion mate with the center portion of the first die to define a pressure cavity filled with fluid between the workpiece, the center portion of the first die and the projection portion of the second die and to force the excess fluid within the workpiece and within the annular projection portion to bleed therefrom;



forming the workpiece by forcing the second die toward the first die thereby compressing the workpiece and placing the fluid in the pressure cavity under pressure to act to force the workpiece outwardly, the first and second dies together defining the desired workpiece configuration and the excess fluid within the annular projection being continually bled while the fluid within the pressurized cavity is sealed therewithin; and

separating the die and removing the formed workpiece.

4,414,835
FLANGE FORMING DRILL APPARATUS

Leo Larikka, Vaasa, Finland, assignor to G. A. Serlachius Oy, Finland

PCT No. PCT/FI81/00006, § 371 Date Sep. 24, 1981, § 102(e) Date Sep. 24, 1981, PCT Pub. No. WO81/02118, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 29, 1981, Ser. No. 305,649
Claims priority, application Finland, Jan. 30, 1980, 800280
Int. Cl.³ B21D 31/02, 53/00
U.S. Cl. 72—71 13 Claims

1. Flange forming drill apparatus for producing a flanged hole in a workpiece, comprising:

a body supporting a rotating drill rod thereon;

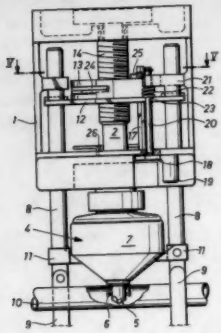
leg means supporting said body for movement toward and away from said workpiece;

a drill bit adjacent an end portion of said drill rod for drilling a hole upon movement of said body toward said workpiece;

a plurality of flange forming members mounted on said end portion of said drill rod for movement between a retracted position when a hole is drilled and an outwardly projecting, flange forming extended position for forming a flange around the edge of said hole upon movement of said body and away from said workpiece;

adjustment means on said drill rod for moving said flange forming members between said retracted and said extended position;

brake bit means on said legs engageable by said adjustment means for extending said flange forming members when said hole is completed; and



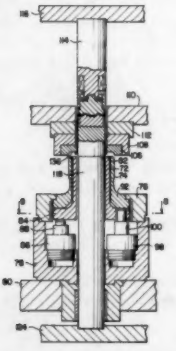
drive clutch means on said leg means movable into and out of driving engagement with said rotating drill rod for moving said body away from said workpiece when said flange forming members are extended to form a flange around the edge of said hole.

4,414,836

METHOD OF AND APPARATUS FOR DEEP DRAWING METAL CONTAINERS

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 430,957
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—349 **28 Claims**



1. Apparatus for forming a deep drawn metal container body by redrawing a drawn cup having an open top, a substantially flat bottom wall, a substantially cylindrical sidewall, and a curved transition section joining the sidewall and bottom wall, the apparatus comprising,

annular redraw sleeve means having a free end adapted to fit within and support a drawn cup, said free end having a first annular clamping surface thereon contoured and arranged to engage the inner surface of the transition section and the adjacent annular peripheral portion of the bottom wall of a drawn cup supported on the redraw sleeve means,

annular redraw die means having a second annular clamping surface thereon in axially aligned opposed relation to said first clamping surface, said second clamping surface being contoured and arranged to engage the outer surface of said transition section and the adjacent annular peripheral portion of the bottom wall of a drawn cup supported on said redraw sleeve means,

one of said annular clamping surfaces being defined by an annular clamping surface portion on each of at least two concentric ring members with the annular clamping surface portion on the outer said ring member being contoured to engage and clamp the curved transition section of a cup,

means for moving said annular redraw sleeve means and said annular redraw die means relative to one another to clamp the transition section and the adjacent bottom wall portion of a cup supported on said redraw sleeve means, and

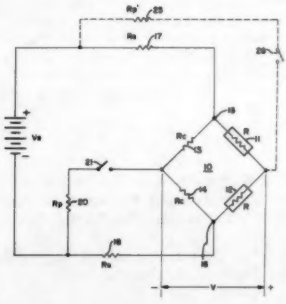
male die means movable relative to said annular redraw die means and said annular redraw sleeve means to progressively draw a clamped cup from between said first and second clamping surfaced through said redraw die means to redraw the cup into a deep drawn container body.

4,414,837

APPARATUS AND METHODS FOR THE SHUNT CALIBRATION OF SEMICONDUCTOR STRAIN GAGE BRIDGES

James W. Bice, Wayne; Charles L. Gravel, River Edge, and Harold Bernstein, Hillsdale, all of N.J., assignors to Arthur L. Plevy, Edison, N.J.

Filed Feb. 16, 1982, Ser. No. 348,919
Int. Cl.³ G01L *25/00*
U.S. Cl. 73—1 B **11 Claims**



1. In a Wheatstone bridge array of the type having a first side comprising first and second equal temperature sensitive resistors in a series path between first and second terminals, and a second side comprising third and fourth equal temperature insensitive resistors in a series path between said terminals and in parallel with said first side, with an output voltage taken between the junction of said first and second resistors and the junction between said third and fourth resistors, the combination therewith of apparatus for shunt calibrating said array relatively independent of temperature, comprising:

means for applying a biasing potential between said first and second terminals,

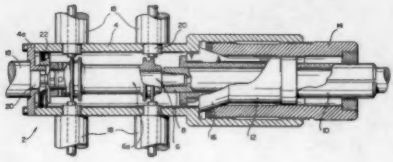
selectively operable shunt calibration means operative to shunt only one of said temperature insensitive resistors in a first selectable position to cause said array to provide a calibrated output voltage independent of temperature.

4,414,838

WIND TUNNEL BALANCE CALIBRATOR

Frederick D. Ward, and Claude Denis, both of Ste-Foy, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Mar. 22, 1982, Ser. No. 360,556
Claims priority, application Canada, Apr. 22, 1981, 375949
Int. Cl.³ G01L *25/00*
U.S. Cl. 73—1 B **7 Claims**



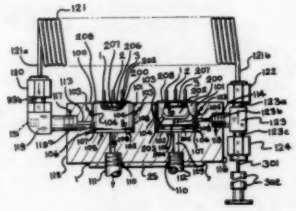
1. A check calibration device for a sting-held wind tunnel balance comprising:
   (a) a housing adapted to be secured rigidly to the sting;
   (b) a plurality of actuators secured to the housing, each positioned to act to generate a load force in a predetermined direction at a predetermined location on the body of the balance when the balance and housing are in position secured to the sting;
   (c) means to vary the load force applied by each actuator;
   (d) means to determine the load force applied by each actuator at a particular point in time;
   (e) means to measure the behavior of the balance in response to the load force applied by each actuator corresponding to that point in time.

4,414,839

GAS SENSING APPARATUS AND METHOD

David R. Dilley, East Lansing; Julian J. L. Lee, Lansing, both of Mich., and Mikal E. Saltveit, Jr., Raleigh, N.C., assignors to Board of Trustees, a Constitutional corporation operating Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 29,293, Apr. 12, 1979, abandoned. This application Oct. 17, 1980, Ser. No. 198,113
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—23 **15 Claims**



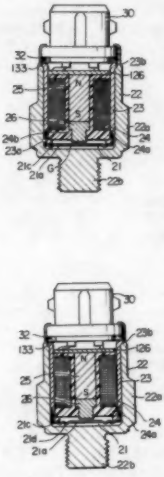
1. An electrically powered oxidizable gas detector apparatus which comprises:
   (a) at least two gas sensor means each having a sensing element which decreases or increases resistance as a function of the adsorption of gaseous oxidizable compounds in air on the sensing elements in a parallel electronic circuit so that the difference in resistance of the two sensing elements can be detected when powered by a direct current power source, wherein the difference in resistance of the sensing elements is a function of the concentration of the compounds and is detected by the electronic circuit and wherein one sensor element is adapted to be used for a reference gas and the other for an unknown oxidizable gas in the reference gas and wherein the oxidizable gas flow in at least the oxidizable gas sensor means is across the sensing element in one direction and out of the sensor means in another direction; (b) electrical heater means adjacent to each sensing element to provide a common operating temperature and powered in parallel by the direct current source and controlled by a voltage regulator means to maintain constant voltage to each heater means;
   (c) detection means in conjunction with the sensing elements for detecting the difference in resistance between the sensing element for the reference sensing element and the other sensing element when there is a difference in composition of gaseous oxidizable compounds in carrier gases supplied to the two sensing means;
   (d) tube means providing a sealed flow path between the sensor means to the sensing elements; and
   (e) inlet means in the tube means for introducing an oxidizable gas in a carrier gas between the sensing means, wherein concentrations of ethylene as the oxidizable gas in the carrier gas between 0.1 and 10 ppm can be detected by the difference in the resistance of the sensing elements.

4,414,840

KNOCK DETECTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Hiroaki Yamaguchi, Anjo; Tadashi Hattori, and Yoshinori Ootsuka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 19, 1981, Ser. No. 235,986
Claims priority, application Japan, Feb. 22, 1980, 55-21770; Sep. 19, 1980, 55-130965
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **8 Claims**



1. A knock detecting apparatus for an internal combustion engine comprising:
   at least one vibrating element having a resonant frequency within a knock frequency range of said engine to be detected, said vibrating element including a disk-shaped vibrating portion, said vibrating portion including at least one rib portion along an outer periphery of said vibrating portion for adjusting the natural frequency thereof by changing the radius of said rib portion,

means for holding the outer peripheral portion of said vibrating element substantially over the entire periphery thereof; and

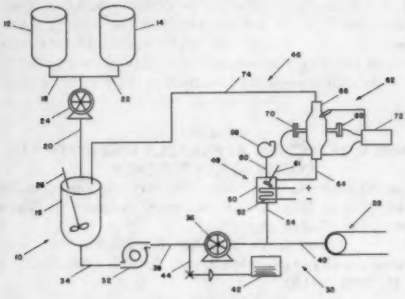
vibration-electricity conversion means, coupled to said vibrating means, for generating an electric signal corresponding to the vibration of said vibrating portion of said vibrating element.

4,414,841

METHOD AND APPARATUS FOR DETERMINING PERCENT SOLIDS IN A SLURRY

Harry S. Porenski, Jr., and Earl E. Kohnhorst, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 6, 1981, Ser. No. 280,200
Int. Cl.³ G01N *15/06*
U.S. Cl. 73—61 R **6 Claims**



1. A method for determining the percent of solids in a solids-liquid mixture, the solids being at least two percent by weight of the mixture, comprising the steps of:

continuously drawing off a sample of the solids-liquid mixture;

heating said sample to a temperature sufficiently high enough to form vapor without boiling the liquid component of said sample;

removing the vapor generated by heating the liquid component of said sample;

continuously passing said heated sample through an ultrasonic signal generating device;

continuously passing an ultrasonic signal through said heated sample;

continuously measuring the velocity and attenuation of the ultrasonic signal in said heated sample;

determining the percent of solids in the solids-liquid mixture corresponding to the measured sonic velocity and attenuation of the ultrasonic signal; and,

continuously returning said sample back to the solids-liquid mixture from which it was drawn.

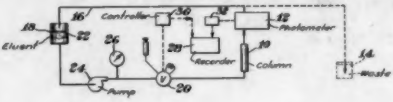
4,414,842

ION EXCHANGE CHROMATOGRAPHY WITH INDIRECT PHOTOMETRIC DETECTION

Hamish Small, and Theodore E. Miller, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 153,814, May 27, 1980, abandoned. This application Apr. 2, 1982, Ser. No. 364,705
Int. Cl.³ G01N *21/00*
U.S. Cl. 73—61.1 C **20 Claims**

1. A single column method of ion analysis using sensitive photometric detection in which liquid eluent containing monitor/displacing ions is added with sample to an ion exchange liquid chromatography column under suitable conditions to resolve for detection purposes sample ions of interest which elute as sample bands in the effluent of the column, the sample ions being of the same charge and less absorbing than the monitor/displacing ions at the chosen photometric monitoring conditions in order to indirectly measure sample bands of interest by the decrements they cause in the absorbance re-



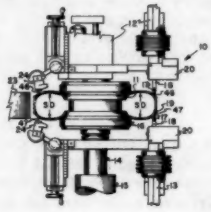
sponse of the eluent, said method being characterized by the selection and use of an eluent which contains not greater than about 5×10^{-3} molar of said monitor/displacing ions for the purpose of sensitive detection by the photometric monitoring step of the indirectly detected sample ions of interest.

4,414,843

TIRE DYNAMIC IMBALANCE SCREENING SYSTEM

Kenneth L. Kounkel, Silver Lake, Kans.; Loren K. Miller, Tallmadge, Ohio; Kenneth A. Spriggel, Akron, Ohio, and Stephen L. Williams, Doylestown, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 19, 1980, Ser. No. 188,707
Int. Cl.³ G01M *1/14*
U.S. Cl. 73—66 **29 Claims**



1. A measuring apparatus for predicting the magnitude of tire variables in addition to lateral runout comprising means to measure lateral runout on one side of said tire during rotation of said tire relative to said measuring means at a position between the area of maximum sectional width and the outer radial face of said tire, second means to measure lateral runout on the other side of said tire during rotation of said tire relative to said second measuring means at a second position having generally the same radius as said first-mentioned position, means to determine the first harmonic values for the runouts at each circumferential position around said tire and means to determine the sum of the first harmonic values at corresponding circumferential locations around said tire to indicate the magnitude of said tire variables.

4,414,844

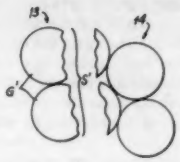
RAPID INSULATION RESISTANCE TEST FOR BISMUTH-CONTAINING CERAMIC CAPACITORS

Bharat Rawal, Myrtle Beach, S.C., assignor to AVX Corporation, Myrtle Beach, S.C.

Filed Jul. 24, 1981, Ser. No. 286,684
Int. Cl.³ G01N *33/38*
U.S. Cl. 73—104 **3 Claims**

1. The method of determining the insulation resistance characteristics of a ceramic capacitor containing bismuth ions which comprises the steps of causing the fracture of a fired

sample of said capacitor to expose an internal area thereof, and establishing an insulation resistance factor as a function of the



proportion of inter-granular fracture present in said exposed area.

4,414,845

FUEL INJECTION NOZZLE, PARTICULARLY FOR DIESEL ENGINES

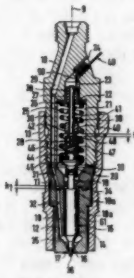
Karl Hofmann, Remseck, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,881

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117779

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **10 Claims**



1. Fuel injection valve and nozzle combination, for use in an internal combustion engine having

a valve body (10,11,12) of electrically conductive material;

a needle valve element (15) of electrically conductive material formed with a valve cone (17) thereon;

a valve seat (16) formed on the valve body;

a valve spring (25) engaging the needle valve element to press the valve cone against the valve seat, and to seal the valve against injection of fuel and to establish an electrical contact between the needle valve element (15) and the valve body (10,11,12) and, upon lifting of the valve element during an injection stroke, to permit injection of fuel and to break the electrical contact so that the valve seat and valve cone will form a first electrical switch,

and comprising, in accordance with the invention

a second electrical switch (40,42; 51,52) electrically serially connected with said first switch, the second electrical switch being controlled by the needle valve element to open upon movement of the needle valve element (15) from the valve seat by a predetermined distance (h_2) corresponding to a portion of the injection stroke (h_1) of the needle valve element, and remaining open so long as the valve cone (17) of the needle valve element is spaced from the valve seat (16) by said predetermined distance.

4,414,846

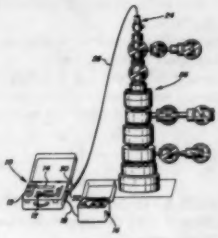
GAS WELL MONITORING DEVICE

Wilbur L. Dublin, Jr., Round Rock, Tex., and Jack Schrenkel, 3709 S. Atlanta, Tulsa, Okla. 74105, assignors to Jack Schrenkel, Tulsa, Okla., a part interest

Filed Feb. 9, 1982, Ser. No. 347,342

Int. Cl.³ E21B *47/06*

U.S. Cl. 73—151 **5 Claims**



1. A gas well monitoring device for installation at a well head for the determination of bottom hole pressure in a well bore comprising:

a fixed sensing unit disposed at the well head and including pressure transducer means and temperature transducer means, said transducer means being exposed to the atmosphere of gas in the well head to thereby measure pressure and temperature of the gas at the well head;

automatic control means for periodically sampling the output of said transducer means;

processor means interconnected to said automatic control means for calculating the value of bottom hole pressure based upon the output of said transducer means;

storage means interconnected to said processor means for receiving and storing at predetermined time intervals related values of the sampled well head pressure and well head temperature, and the calculated value of bottom hole pressure at said predetermined time intervals; and

display means for displaying well data stored in said storage means including bottom hole pressure values.

4,414,847

GAS FLOW MEASURING APPARATUS

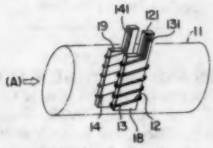
Tokio Kohama, Nishio; Hisasi Kawai, Toyohashi; Hideki Obayashi, Okazaki, and Tsuneyuki Egami, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 23, 1981, Ser. No. 286,344

Claims priority, application Japan, Jul. 28, 1980, 55-104048

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **6 Claims**



1. A gas flow measuring apparatus comprising

a measuring tube in which a gas to be measured flows,

a first support member made of an electric insulating material mounted at a position at the inside of said measuring tube, said position being exposed to the gas flow to be measured,

an electric heater resistance wire,

a first temperature-dependent resistance wire, said electric heater resistance wire and said first temperature-dependent resistance wire being wound side by side but avoiding occurrence of any short-circuit therebetween on said first support member,

a second support member of an electric insulating material mounted at a position at the inside of said measuring tube, said position being exposed to the gas flow to be measured and adjacent to said first support member, to be free from the effect of heat of said electric heater resistance wire in said measuring tube,

a second temperature-dependent resistance wire would on said second support member, and

a measuring circuit for applying a voltage to said electric heater resistance wire and said first and second temperature-dependent resistance wires for measuring the flow of the gas.

4,414,848

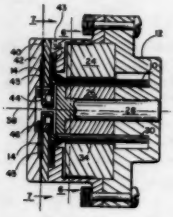
THREE-AXIS ACCELEROMETER

Sidney G. Shutt, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 13, 1981, Ser. No. 292,460

Int. Cl.³ G01P *15/13*

U.S. Cl. 73—497 **9 Claims**



1. An accelerometer, comprising:

a base;

a proof mass;

electromagnetic means for constraining displacement of said proof mass relative to said base in three degrees of freedom;

elastic suspension means for constraining displacement of said proof mass relative to said base, wherein said elastic suspension means comprises a plurality of filaments extending between said proof mass and said base, and wherein one end of each of said filaments is attached to a suspension region of said proof mass; and

capacitive pickoff means for sensing translational displacement along the longitudinal axis of said proof mass and for sensing rotational displacement about two orthogonal cross axes of said proof mass, wherein all capacitive elements of said pickoff means are clustered adjacent the suspension region of said proof mass.

4,414,849

APPARATUS AND A METHOD FOR INDICATING VARIATIONS IN ACOUSTIC PROPERTIES ON AN INTERFACE

Michael H. Brown, Didcot, and Roger Martin, Faringdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

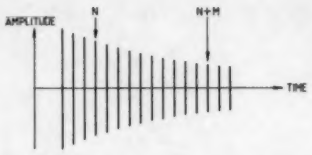
Filed Oct. 13, 1981, Ser. No. 310,867

Claims priority, application United Kingdom, Oct. 20, 1980, 8033737

Int. Cl.³ G01F *23/00, 23/28*; G01N *29/00*

U.S. Cl. 73—290 V **8 Claims**

1. Apparatus for indicating variations in acoustic properties at the interface of a first material in contact with a second material, which first material is capable of transmitting elastic waves therethrough, which apparatus comprises transducer means for injecting an elastic wave signal pulse into the said first material so as to be repeatedly reflected back and forth across the said first material between a surface of predetermined reflection properties and the interface between the first material and the second material, the first material being such that the attenuation with distance of elastic waves traversing therethrough is substantially constant, an amplifier for providing electrical signals corresponding to received reflected signal pulses, detector means for detecting the electrical signal corresponding to an early reflected signal pulse (N), automatic gain control means so controlling the amplifier as to set to a predetermined level the amplitude of the said electrical signal (N) and to determine the gain of the amplifier for subsequent electrical signals corresponding to later reflections of the pulse, comparison means for comparing with a reference standard the amplitude of an electrical signal corresponding to a selected later reflection (N+M) of the pulse, response means for indicating in response to the comparison a change in the attenuation of pulses upon reflection at the said interface, the said response means being inhibited from operating in response to signals corresponding to reflections of the pulse between the said early reflection (N) and the said selected later reflection (N+M).



4,414,850

MEASUREMENT METHOD AND SYSTEM UTILIZING ULTRASONIC WAVE

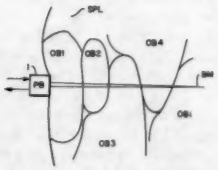
Hirohide Miwa, Kawasaki; Takaki Shimura, Machida, and Keiichi Murakami, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 3, 1981, Ser. No. 269,861

Claims priority, application Japan, Jun. 3, 1980, 55-74680

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—599 **20 Claims**



1. A measurement method utilizing ultrasonic waves for measuring attenuation characteristics of domains in an object, comprising the steps of:

(a) transmitting ultrasonic waves of plural different frequencies to an object;

(b) receiving the ultrasonic waves reflected from the object; and

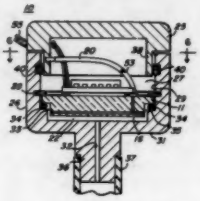
(c) measuring the attenuation characteristics of the domains on the basis of the ratio of intensities of the received reflected ultrasonic waves.

4,414,851

GAUGE PRESSURE SENSOR

Rastko C. Maglic, Colorado Springs, Colo., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1981, Ser. No. 297,436
Int. Cl.³ G01L 9/12
U.S. Cl. 73—706 **16 Claims**



1. In a gauge pressure sensor comprising:

a pressure transducer including a base and a flexible diaphragm mounted to said base, said diaphragm having first and second substantially parallel opposite facing external surfaces, said base and diaphragm first external surface substantially defining an internal transducer cavity for receiving a first predetermined pressure;

transducer housing means having peripheral walls and a main interior cavity, said housing means providing an outer protective mechanical shell surrounding said transducer; and

mounting means for mounting said transducer in said housing means main interior cavity and fixing said transducer to said housing means;

said second external diaphragm surface of said transducer and a portion of said housing means substantially defining an external transducer cavity for receiving a second predetermined pressure;

said diaphragm being displaceable and flexing with respect to said transducer base in response to changes in the pressure difference between said first and second predetermined pressures wherein electrical characteristics of said transducer are altered in response to the displacement of said diaphragm and are therefore altered in response to sensed differential pressure changes, and wherein one of said first and second reference pressures is representative of ambient atmospheric pressure existing external to said housing means;

the improvement comprising the combination of:

an ambient pressure receiving cavity formed in and by said housing means and opening directly external to said housing means for receiving therein the atmospheric pressure external to said housing means, said ambient cavity including openings in said peripheral walls of said housing means providing for direct coupling to the ambient atmosphere external to said housing means to said ambient pressure receiving cavity, said openings provided peripherally about said housing means and opening directly external to said housing means, said peripheral openings disposed over more than 180 degrees of rotation about an axis passing through said housing means and centrally located,

a pressure transmitting means comprising a tube provided in said main interior cavity of said housing means and having inlet and outlet ends, said inlet end coupled to and receiving the atmosphere in said ambient pressure receiving cavity and said outlet end coupled to and receiving the atmosphere in one of said internal and external transducer cavities, said pressure transmitting means transmitting pressure between said ambient pressure receiving cavity and said one of said internal and external cavities, and

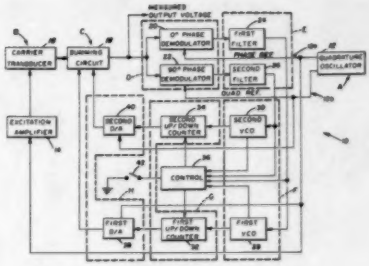
an isolating means comprising a fluid present within said tube for preventing direct connection of the atmosphere contained in said inlet end with said atmosphere contained in said outlet end but permitting the transmission of pressure changes therebetween by said pressure transmitting means, whereby ambient atmospheric contaminants external to said housing means are prevented from reaching and substantially impairing the operation of said transducer diaphragm thereby preventing erroneous pressure sensing operation.

4,414,852

AUTOMATIC ZERO BALANCE CIRCUIT

Thomas J. McNeill, Lyndhurst, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 14, 1981, Ser. No. 301,628
Int. Cl.³ G01B 7/00; H04B 1/12
U.S. Cl. 73—765 **16 Claims**



1. An automatic zero circuit for use with carrier transducers, said automatic zero circuit comprising:

a reference generator for generating a phase reference signal and a quadrature reference signal, said transducer being operatively connected to said reference generator and powered by said reference generator;

a summing circuit operatively connected to said transducer for receiving a return signal from said transducer, for summing said return signal with at least one other signal and for generating an output signal equal to the summation of said return signal and said at least one other signal;

means operatively connected to said summing circuit for separating said output signal of said summing circuit into at least one component value with respect to said reference generator;

means operatively connected to said separating means for generating at least one DC signal with a value indicative of said at least one component value;

means operatively connected to said generating means for converting the value of said at least one DC signal into at least one modulated signal whose frequency is proportional to the value of said DC signal;

means operatively connected to said converting means for counting said at least one modulated signal; and

means operatively connected to said counting means and said summing circuit for generating said at least one other signal in response to the count and being proportional to and opposite from said at least one component value, the output signal from said summing circuit being nulled.

4,414,853

PRESSURE TRANSMITTER EMPLOYING NON-LINEAR TEMPERATURE COMPENSATION

Janusz Bryzek, Santa Clara, Calif., assignor to The Foxboro Company, Foxboro, Mass.

Filed Aug. 10, 1981, Ser. No. 291,665
Int. Cl.³ G01B 7/18; G08C 19/04, 25/02
U.S. Cl. 73—766 **20 Claims**

1. A pressure transmitter of the type including a substrate carrying a plurality of resistors at least one of which has a

resistance value varying with changes in strain developed in said substrate so as to provide a measure of the magnitude of the pressure producing such strain; said transmitter comprising:

a resistance network including said one strain-responsive resistor;

said network having input and output circuits;

power supply means coupled to said input circuit of said network to produce a flow of current therein so as to activate said network and develop an output signal in said output circuit responsive to said changes in strain;

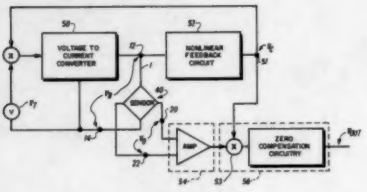
temperature sensing means for producing a temperature signal which varies with changes in resistance of said network resulting from changes in temperature thereof;

said output signal having an error which varies in accordance with said temperature changes;

means responsive to said temperature signal including at least first amplifier means coupled to receive said temperature signal, means for saturating the output of said first amplifier means whenever the temperature signal corresponds to temperatures which are respectively less than a first temperature or greater than a second temperature, second amplifier means coupled to receive said temperature signal, and means for saturating the output of said second amplifier means whenever the temperature signal corresponds to temperatures which are respectively less than a third temperature or greater than a fourth temperature;

means for combining the outputs of said first and second amplifier means and producing a discontinuous signal having at least two discontinuous segments which are characterized by break points occurring at said first through fourth temperatures; and

means responsive to said discontinuous signal for changing said output signal so that said temperature dependent errors therein are substantially eliminated.



4,414,854

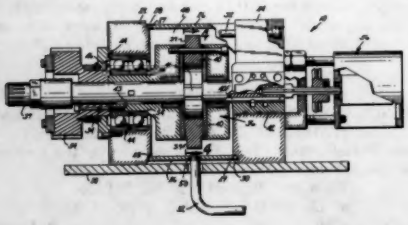
ROTARY ACTUATOR ASSEMBLY

Steven R. Haeg, Shorewood, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Oct. 30, 1981, Ser. No. 316,679

Int. Cl.³ G01N *3/22*

U.S. Cl. 73—847 **7 Claims**



1. An improved rotary actuator assembly for introducing dynamic torque loads into a rotatable test specimen, the improved assembly comprising:

a first stationary support;

a second stationary support in a fixed spatial relationship with the first stationary support;

bearing means positioned on the first stationary support;

a rotary hydraulic actuator rotatably supported by the bearing means and positioned between the first and second stationary supports, said rotary hydraulic actuator having a shaft and a housing, the relative rotational position of the shaft and housing being controllable and the shaft extending out of the housing and being mounted for rotation on the second support, said shaft having passageways therein, a hydraulic commutator mounted in the second support and surrounding the shaft, said passageway in the shaft mating with said commutator;

means to couple the actuator to a rotatable test specimen and to couple the actuator to a load to permit loading the specimen under torque transmitted through the actuator; and

a shroud extending between and mounted on the first and second stationary supports and surrounding the rotary actuator to shield the actuator with a closed stationary shield as the actuator and specimen are rotated.

4,414,855

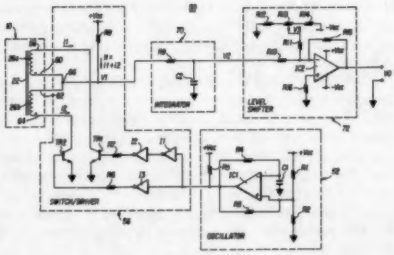
TORQUE SENSOR

Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 1, 1981, Ser. No. 268,890

Int. Cl.³ G01L *3/10*

U.S. Cl. 73—862.36 **2 Claims**



1. A torque sensor, comprising:

a non-magnetic drive shaft coupled between a source of torque and a load, said drive shaft including a cylindrical outer surface;

a thin magnetically soft amorphous metal material affixed to said cylindrical surface of said drive shaft;

first and second cylindrical pick-up coils, each having a longitudinal axis which is colinear with the longitudinal axis of said drive shaft;

first electronic switch means coupled in series with a source of DC power and said first pick-up coil for controlling the flow of a first current through said first pick-up coil, said first current being proportional to the permeability of said amorphous material;

second electronic switch means coupled in series with said DC power source and said second pick-up coil for controlling the flow of a second current through said second pick-up coil, said second current being proportional to the permeability of said amorphous material;

oscillator means, connected to said first electronic switch means and said second electronic switch means, for generating an AC switching signal to control said first and second electronic switch means;

integrator circuit means, coupled to said first and second

pick-up coils, for integrating said first and second currents;

level shifter current means, coupled to said integrator circuit means, for generating an output signal proportional to the stress of said drive shaft whereby the torque applied to said drive shaft is represented, said output signal having a zero level in the absence of applied torque to said drive shaft.

4,414,856

METHOD AND APPARATUS FOR MEASURING STATIC AND DYNAMIC TORQUES IN A CONTACT FREE MANNER

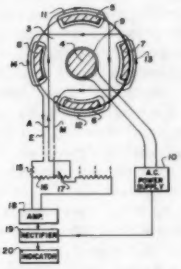
Horst Winterhoff, Dreieich-Buchschlag, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,500

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 3031997

Int. Cl.³ G01L *1/12*

U.S. Cl. 73—862.36 **3 Claims**



2. An apparatus for the contact-free measurement of torque on a magnetically permeable test piece, which permeability changes with torque applied to the test piece, comprising:

at least one test head having a magnetic core with four mutually spaced pole portions adapted to be positioned close to a surface of the test piece, each pole portion being in the shape of a ring segment of a common ring, which ring is divided into the four spaced pole portions by four slots;

a winding on each of said pole portions defining a magnetic bridge adapted to sense magnetic permeability changes in the test piece surface, said magnetic bridge including a separate winding on each of said mutually spaced pole portions with opposite pole portions carrying windings which are connected to each other in series and wound in the same direction;

a substantially central pole portion connected to said magnetic core;

an excitation winding on said central pole portion;

a source of alternating current connected to said excitation winding; and

a magnetic permeability circuit portion having three contacts, two of said contacts each connected to a respective pair of said series connected windings and a remaining one of said contacts connected to both pairs of said series connected windings;

said source establishing an alternating magnetic field in the test piece surface to the point of magnetic saturation thereof, and said circuit portion connected to said magnetic bridge for sensing permeability changes in the test piece surface.

4,414,857

METHOD AND APPARATUS FOR INJECTING SAMPLES INTO GAS CHROMATOGRAPH

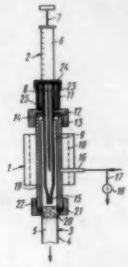
Vadim V. Brazhnikov, ulitsa 26 Bakinskikh komissarov, 3, korpus 3, kv. 324; Eduard P. Skornyakov, Kronshtadsky bulvar, 49, kv. 66; Jury A. Sultanovich, Profsojuznaya ulitsa, 3, korpus 3, kv. 53; Vladimir M. Poshemansky, 2 Pavlovsky pereulok, 20, kv. 80; Karl I. Sakodynsky, ulitsa Vavilova, 12, kv. 29; Semen S. Berlin, ulitsa Sovkhoznaya, 53, korpus 1, kv. 33; Vladimir V. Ogurtsov, Fergansky proezd, 14, korpus 2, kv. 81, and Vladimir V. Alekhin, ulitsa Kuusinena, 6, korpus 7, kv. 79, all of Moscow, U.S.S.R.

Filed Aug. 10, 1981, Ser. No. 291,390

Claims priority, application U.S.S.R., Aug. 16, 1979, 2808727

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—863.11 **15 Claims**



1. A method of injecting samples into a gas chromatograph, comprising the steps of: communicating a sample carrier in which the sample to be analyzed is contained with an evaporator; pressure-sealing the evaporator with the sample carrier in communication therewith; introducing the sample into the evaporator while the latter is pressure-sealed to form vapours thereof; passing the vapours of the sample to be analyzed from the evaporator through a flow constrictor having a substantially constant cross-section and into a chromatographic column; subsequent to passing the vapours into the chromatographic column, communicating the evaporator with the atmosphere; and while the evaporator is in communication with the atmosphere, passing at least a portion of a carrier gas flow into the evaporator, whereby contaminants are prevented from entering into the chromatographic column with the sample.

4,414,858

STEAM TURBINE FLUID SAMPLING APPARATUS

Steven H. Peterson, Murrysville, and David F. Pensenstadler, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1982, Ser. No. 360,739

Int. Cl.³ G01N *1/26*

U.S. Cl. 73—863.33 **7 Claims**

1. Apparatus for sampling fluids from a plurality of sampling points in a steam turbine system having a steam supply, a steam turbine arrangement driven thereby, a condenser for condensing exhaust steam from said turbine arrangement and a recirculating fluid path, for returning condensed steam back to said supply, comprising:

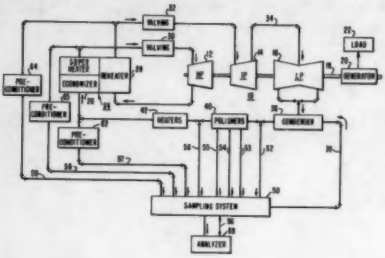
(A) a valve arrangement having a plurality of valves each of which may be activated in response to an applied control signal;

(B) a plurality of fluid sample lines connected between selected points in said steam turbine system and said valve arrangement;

(C) analyzing means for analyzing selected fluid samples passed by said valving arrangement;

(D) a common drain line connected to supply fluid back to said steam turbine system;

(E) computer means operable to supply said applied control signals control signals to activate selected ones of said valves in accordance with a set of stored instructions, so as to place a single one of said fluid sample lines in fluid communication with said analyzing means;



(F) said computer means and valve arrangement being such that all non-selected fluid sample lines are in continuous fluid communication with said common drain line so as to return fluid in said sample lines back to said steam turbine system from which it came, for reuse thereby.

4,414,859

BEVEL GEAR DIFFERENTIAL DRIVES AND METHODS FOR ADJUSTING THEIR TOOTH ENGAGEMENT

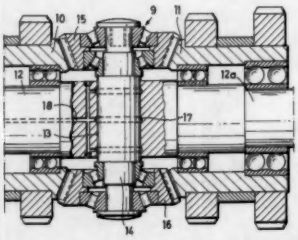
Helmut Holthoff, Düsseldorf, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Company, Hilden, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,605

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001342

Int. Cl.³ F16H *1/14*

U.S. Cl. 74—417 **10 Claims**



1. A bevel gear differential drive comprising a sun gear shaft having a transverse bore intermediate its ends, a pair of sun gears fixed against axial movement and rotatable on said sun gear shaft on opposite sides of said bore and functionally equally spaced therefrom, at least one planetary gear shaft in said transverse bore having an end extending from each side of said bore, a planetary gear fixed on each said end extending from the bore and means on said sun gear shaft for shifting the planetary gear shaft in the bore along with the planetary gears until flank play between the planetary gears and sun gears is substantially equal, and means frictionally fixing the planetary gear shaft as a press fit against a further movement in the transverse bore of the sun gear shaft.

4,414,860

CONNECTING ROD FOR AN ENGINE

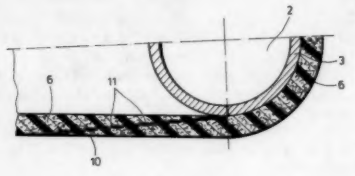
Klaus Brunsch, Weidach, and Rudolf Schindler, Riemerling, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 217,040

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951111

Int. Cl.³ G05G *1/00*

U.S. Cl. 74—579 E **7 Claims**



1. Connecting rod assembly for engines with rotating crankshaft, comprising an axially elongated member having a first opening and a second opening spaced apart in the axial direction of said member and the first opening located adjacent one end of said member for receiving a connecting rod and the second opening located adjacent the other end of said member for receiving a crankshaft bearing, the axes of said first and second openings extend substantially perpendicularly of the axis of said member, a connecting rod shaft extends in the axial direction of said member between the first and second openings, a belt of fiber reinforced plastics material extends around said first opening and said second opening and said connecting rod shaft extending between said openings, said belt comprises a first part partly encircling the axis of said first opening with said first part having a pair of ends spaced apart in the encircling direction, a second part partly encircling the axis of said second opening with said second part having a pair of ends spaced apart in the encircling direction, and a pair of third parts each located on an opposite side of the axis of said member and each extending between said first and second parts with each said third part extending between a different one of the ends on said first part and a different one of the ends on said second part, said first, second and third parts of said belt each having an inside surface closer to the axes of said first and second openings and said member and an outside surface, said belt is cut obliquely of the direction of said third parts extending between said first and second parts and adjacent the ends of said second part from the inside surface of said belt at the ends of said second part to the outside surface of said belt at a location spaced between the ends of said first and second parts with the oblique cuts extending approximately parallel to the axial direction of said member, each said oblique cut having a pair of facing oblique cut surfaces and a highly heat-resistant adhesive placed between the oblique cut surfaces of said oblique cut for splicing said belt together.

4,414,861

GEAR DRIVE COOLING

Ronald A. Witt, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

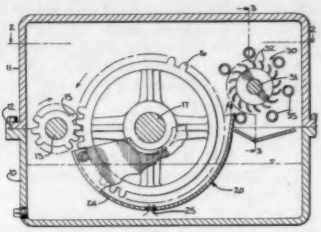
Filed Feb. 17, 1982, Ser. No. 349,630

Int. Cl.³ F16H *57/04, 57/02*; F01M *5/00, 1/00*

U.S. Cl. 74—606 A **6 Claims**

1. In a gear drive which includes an enclosed housing defining a fluid reservoir, an input shaft and an output shaft each journaled in opposite side walls of the housing, and meshing

gearing connecting the shafts including a gear which rotates through fluid in the reservoir, the improvement comprising:



a rotatable impeller mounted on a shaft in the housing and having vanes which are in the path of fluid ejected from the periphery of the gear as it rotates, and

a fan connected to the impeller shaft exterior of the housing.

4,414,862

PLANETARY GEAR ARRANGEMENT FOR A CONTINUOUSLY VARIABLE TRANSMISSION

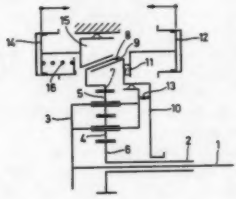
Eugen Svab, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 30, 1981, Ser. No. 249,577

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016485

Int. Cl.³ F16H *3/44*

U.S. Cl. 74—788 **3 Claims**



1. A forward and reversing gear arrangement for a continuously variable transmission comprising:

input and output shafts for transmitting power to and from the gearset;

a planetary gear unit including a planet pinion carrier connected to the input shaft, a ring gear, a sun gear connected to the output shaft, a first set of planet pinions driveably engaged with the sun gear and rotatably mounted on the carrier, and a second set of planet pinions rotatably mounted on the carrier driveably engaged with the ring gear and with the first set of planet pinions;

first and second conical drive surfaces formed on the ring gear;

a clutch continuously driveably connected to the carrier, mounted for axial movement toward and away from the ring gear drive surfaces, having a surface adapted to driveably engage one of the ring gear drive surfaces,

a first piston moveable within a first chamber, adapted to move the clutch into engagement with the first drive surface of the ring gear as the first chamber is pressurized;

a brake continuously driveably connected to the transmission housing, mounted for axial movement toward and away from the ring gear drive surfaces, having a surface adapted to driveably engage the second ring gear drive surface; and

a second piston moveable within a second chamber, adapted to move the brake into engagement with the other drive surface of the ring gear as the second chamber is pressurized.

4,414,863

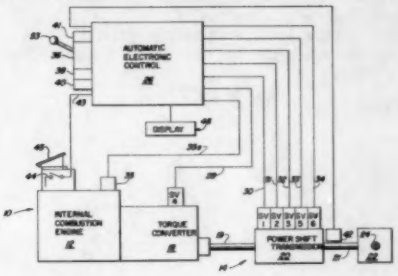
AUTOMATIC ELECTRONIC CONTROL FOR A POWER SHIFT TRANSMISSION

Dean L. Heino, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 122,404, Feb. 19, 1980, abandoned. This application Sep. 15, 1982, Ser. No. 418,145

Int. Cl.³ F16H *3/74*; B60K *41/18*

U.S. Cl. 74—866 **54 Claims**



1. In a mobile vehicle having selectable first and second modes of operation, a transmission system including a torque converter driven by a throttle controlled engine, wherein in the first mode of operation the vehicle is typically subjected to substantially heavier and more abrupt loading than in the second mode, selectively activatable lockup means for locking and unlocking the torque converter to provide direct drive and torque converter drive, respectively, therethrough, a transmission operably connected to the torque converter, said transmission shiftable up and down among a plurality of gear ratios, wherein the torque converter provides cushioning effect between the engine and transmission when in the unlocked condition, and wherein the engine when throttled down provides braking action to the transmission when the torque converter is locked, selectively activatable shifting means operably associated with the transmission for shifting the transmission among the gear ratios, and a speed sensor responsive to the speed of the transmission output to provide a speed signal indicative of the speed thereof, control means for activating the shifting means and lockup means comprising:

first means for establishing at least first, second and third selectable shifting patterns, each pattern defining a plurality of transmission gear ratio upshift points and downshift points corresponding to first, second and third sets of preselected speed signals, respectively, wherein at least said second shifting pattern also defines torque converter locking and unloading points corresponding to a fourth set of speed signals, respectively, and wherein said first shifting pattern also defines a torque converter locking point above a preselected output speed signal;

second means operably associated with the engine throttle and the first means for causing the first shifting pattern to be selected when the throttle is below a pre-selected engine speed setting while the vehicle is operating in the second mode and for causing the second shifting pattern to be selected when the throttle is above the pre-selected setting while the vehicle is operating in the second mode;

third means responsive to selection of the first mode of operation and operably associated with the first means for selecting the third shifting pattern when the first mode is selected and preventing torque converter lock-up so that said cushioning effect is provided; and

fourth means connected between the first means and the shifting and lockup means responsive to the shifting pattern selected and to the speed signal to activate the shifting means and shift the transmission up and down in accordance with the defined upshift and downshift points of

the selected pattern and to selectively activate the lockup means in accordance with the defined locking and unlocking points when the second shifting pattern is selected, and to provide said braking action above said output speed when the first pattern is selected.

4,414,864

MEANS FOR ACCOMMODATING AN INK ROLLER

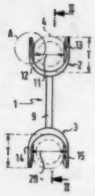
Gerhard Nagel, Hirschhorn, and Klaus Dasting, Neckarsteinach, both of Fed. Rep. of Germany, assignors to Esselte Pendatflex Corporation, Garden City, N.Y.

Filed Aug. 7, 1981, Ser. No. 291,127

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033572

Int. Cl.³ B25B *9/00*

U.S. Cl. 81—3 R **3 Claims**



1. An apparatus for accommodating an ink roller having a circular cylindrical ink carrier body and end discs which are disposed at the end faces thereof and the diameter of which is greater than that of the ink carrier body, said apparatus comprising two U-shaped shells connected together whose width at their open ends is equal to the width of the ink roller to be accommodated, whose depth is equal to the diameter of the end discs of the ink roller to be accommodated, said shells having at their two sides regions which act as clamps for the end discs, the width of the one shell being constant over its entire depth and the width of the other shell increasing from the open end in the direction towards the closed end wherein the shells are joined together in such a manner that their open ends point in opposite directions.

4,414,865

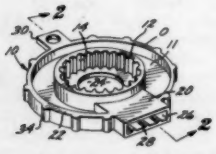
BEVERAGE BOTTLE AND CAN OPENER

Paul Brooks, 2701 Edwin Pl., and John P. Brooks, 2112 Outpost Dr., both of Los Angeles, Calif. 90068

Filed Feb. 26, 1982, Ser. No. 352,806

Int. Cl.³ B67B *7/44, 7/40, 7/18*

U.S. Cl. 81—3.1 R **6 Claims**



1. A combined opener for a twist-off bottle cap on a beverage can lift-off tab, said opener comprising:

a body member provided with a downwardly opening recess formed about its periphery with protuberances adapted to complementarily mate with the knurls of said bottle cap;

a horizontal socket extending outwardly from one side of said recess, said socket being formed with a tunnel to receive said lift-off tab;

a downwardly depending peripheral lip member circumferentially disposed about said side of said recess, said horizontal socket formed in one piece formation with said side of said recess and said lip member; and,

with said body member being rotated when said recess is applied over a twist-off bottle cap to facilitate the removal of said cap from said bottle, and said body member being raised upwardly when said socket is applied over the lift-off tab of a can to lift said tab from said can.

4,414,866

CAP REMOVER

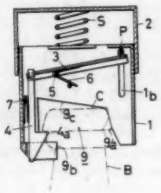
Hiroshi Kichijyo, 1563, Oaza Kosaibe, Oyodo-cho, Yoshino-gun, Nara Prefecture, Japan

Filed Jan. 15, 1981, Ser. No. 225,321

Claims priority, application Japan, Feb. 6, 1980, 55-14050; May 30, 1980, 55-72908; Nov. 26, 1980, 55-167141

Int. Cl.³ B67B *7/00*

U.S. Cl. 81—3.46 R **12 Claims**



1. A cap remover for removing a cap having an exposed rim undersurface from the mouth of a bottle, comprising:

a main body having an opening in the bottom thereof for receiving the mouth of a bottle with a cap thereon, with main body including in said opening a lower surface and an upper surface above said lower surface for respectively engaging the mouth and the cap;

a lever pivotally mounted to said main body to pivot about a first axis; and

a hooking member having a hook portion at a lower end thereof for engaging the rim undersurface of the cap pivotally mounted to said lever for pivoting about a second axis spaced from said first axis with said upper and lower surfaces respectively engaging the cap and the mouth of the bottle, whereby pivoting of said lever about said first axis lifts said hooking member upward with respect to said upper and lower surfaces to pry said cap from the said bottle.

4,414,867

JOINTED TOOL

Arthur O. Koltveit, 1410 S. Sterling St., Streator, Ill. 61364

Continuation-in-part of Ser. No. 52,450, Jun. 26, 1979, Pat. No. 4,277,992. This application Jul. 13, 1981, Ser. No. 283,016

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ B25B *13/00*

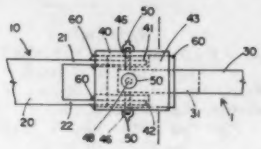
U.S. Cl. 81—177 UJ **5 Claims**

1. A tool joint having a first portion for rotatably driving said joint, a second work-contacting portion, and a pin-mounted gimbal ring connection including outside and inside pin-like pivot means joining said first and second portions, the improvement in said gimbal connection comprising:

said second portion including a tubular section having a rectangular inner periphery, and,

said gimbal connection including a rectangular ring pivotally mounted within said tubular section by said outside pin-like pivot means in closely adjacent, spaced relation to said rectangular inner periphery,

whereby adjacent walls and surfaces of the joint abut each other during the rotation of said joint whereby torque



normally exerted on the pins of said gimbal connection is relieved.

4,414,868

BOX JOINT FOR A PLIER-TYPE TOOL WITH REMOVABLE SECURING PLATE

Nicholas S. Puro, Upper Saddle River, N.J., assignor to Micro Dent Industries, Inc., Hawthorne, N.J.

Filed Jan. 7, 1982, Ser. No. 337,663
Int. Cl.³ B25B 7/06
U.S. Cl. 81—416 **11 Claims**

1. A box joint for a plier-type tool in which the movable member portions are pivotally retained and manipulated, this tool having handle and jaw portions integrally connected, said improved box joint enabling assembly and disassembly without distorting the box joint portion and requiring reshaping of the distorted portion by and with heat and pressure, the box joint including:

(a) first member portion extending between a handle and jaw portion and providing a midportion of the box joint, this midportion having a length greater than its width and finished on its extending and transverse surfaces with said midportion providing substantially one-half the thickness of the box joint and with the finished surfaces substantially parallel to each other;

(b) a second member portion extending between a handle and jaw portion and providing two outer wall retentions of the box joint, the interior surfaces finished to snugly mate with and retain the midportion of the other member portion;

(c) a transverse opening formed in one of the outer wall portions of said second member forming the box joint, this opening having stepped shoulder end configurations, this opening having the narrower portion at the inner edges thereof and with this inner narrower portion opening greater than the width of the midportion of the first member, said narrower portion providing retention portions for the midportion of the first member after insertion and rotation of the first and second members toward and to an in-use and closed condition;

(d) a retaining plate sized so as to enter and be seated in said transverse opening of the second member and with ends formed on said plate providing stepped shoulders sized to be a sliding fit in said opening, the inner surface of said plate finished so as to provide a contiguous mating surface with the facing misportion of the first member when said plate is mounted in said opening, and

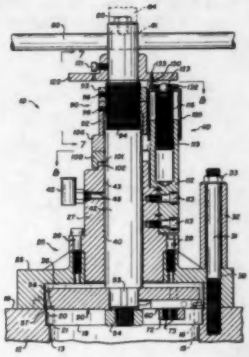
(e) a retaining cap screw having a head portion that engages the retaining plate to prevent unwanted outward movement, a shank of the screw passing through a hole in the plate and midportion and a threaded end of said screw entering into a threaded aperture in the outer wall of the second member, the screw adjusted to provide the desired tightening of the box joint.

4,414,869

COUNTERBORE BORING AND REFACING TOOL

Paul M. Augustine, 418 E. First Ave., North Vancouver, British Columbia, Canada (V7L 1B7)

Filed Apr. 13, 1981, Ser. No. 253,599
Int. Cl.³ B23B 3/24
U.S. Cl. 82—4 R **8 Claims**



1. A tool for removing material from a cylindrical opening in a workpiece, said tool comprising a mounting hub adapted to be secured to the workpiece over the cylindrical opening, a shaft rotatably and axially movable in the mounting hub with the longitudinal axis of said shaft aligned with the corresponding axis of the cylindrical opening, a cutter head secured to the shaft for rotation within the cylindrical opening and including a cutting tool mounted in a position to engage a face of the cylindrical opening, means for rotating and advancing the shaft to operate the cutting tool, a first threaded feed member on the mounting hub alongside an upper portion of the shaft, a second threaded feed member threadedly engaging the first threaded feed member, a feed plate mounted on the upper portion of the shaft to rotate with said shaft while in operative engagement with the second threaded feed member, means for rotating the shaft, and drive-transmitting means operatively connecting the feed plate to the second threaded feed member whereby rotation of the shaft to operate the cutting tool results in rotation and advancement of the second threaded feed member allowing axial movement of the shaft at a rate of feed commenserate with the speed of rotation of the shaft, depth control means between the shaft and the mounting hub for selectively controlling axial movement of said shaft whereby to limit the distance the cutting tool is moved into the cylindrical opening, said depth control means comprising first and second adjusting nuts threadedly secured to the shaft above the mounting hub, and a slotted centering spacer removably mounted on the shaft between the first adjusting nut and the mounting hub.

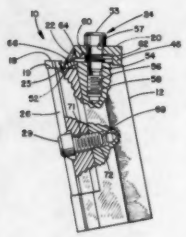
3. A tool for refacing a counterbore of a cylinder formed in an engine block and comprising a mounting hub securable to the engine block, a shaft rotatably and axially movable in the mounting hub with the longitudinal axis of said shaft aligned with the corresponding axis of the counterbore, a cutter head secured to the shaft for rotation within the counterbore and

including a cutting tool, means for rotating the shaft to apply the cutting tool to the counterbore, an internally threaded body fixedly secured to the mounting hub alongside the shaft, a feed screw threaded into the body, a feed plate mounted on the shaft for rotation therewith, a thrust bearing on the feed screw engagable by the feed plate, a driven sprocket nonrotatably secured to the feed screw, and a drive pin carried by the feed plate to engage the driven sprocket whereby rotation of the shaft to operate the cutting tool results in advancement of the feed screw allowing axial movement of the shaft and cutting action of the cutting tool at a rate of feed commenserate with the speed of rotation of the shaft.

4,414,870
CUTTING TOOL

John L. Peterson, Jr., Davidson County; Fred E. Chaffin, Wilson County, and Gene T. Youree, Davidson County, all of Tenn., assignors to Peterson Tool Company, Nashville, Tenn.

Filed Feb. 19, 1981, Ser. No. 236,030
Int. Cl.³ B23B *29/04*; B26D *1/00*
U.S. Cl. 82—36 R **15 Claims**



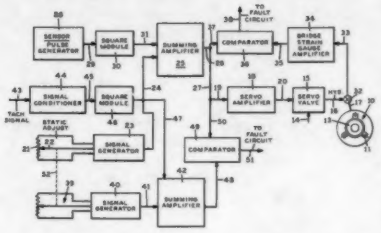
1. A cutting tool comprising:
a tool body;
a support surface disposed on said tool body;
a cutting insert for being mounted on said cutting tool, said cutting insert being configured for engaging and being supported on said support surface;
a clamp disposed adjacent to said cutting insert when said cutting insert is positioned on said support surface;
a clamp tip fixedly mounted on an edge of said clamp, extending away from said clamp toward said cutting insert, and being positioned and configured for securing said cutting insert on said support surface, said clamp tip being a generally rectangular strip of hard material that is resistive to wear relative to said clamp to protect the end of said clamp, said strip being mounted on an edge of said clamp and extending from said clamp toward said support surface; and
structure disposed on said cutting insert to engage said clamp tip for securing said cutting insert on said support surface so that said structure and said clamp tip interengage to resist movement of said cutting insert relative to said cutting tool.

5. A cutting tool comprising:
a tool body;
an anvil mounted on said tool body;
a support surface formed on said anvil;
a cutting insert disposed on said support surface for cutting metal;
a clamp mounted on said tool body and having a front edge disposed adjacent to said cutting insert and a midsection and a rear edge disposed adjacent to said tool body;
a clamp tip mounted on the front edge of said clamp and being constructed of a hard material relative to said clamp, said clamp tip extending away from said clamp and toward said cutting insert on said support surface; and
positioning structure disposed on said insert for engaging only said clamp tip, said clamp tip and said positioning structure having interengaged surfaces disposed at angles oblique to said support surface to resist movement of said cutting insert along said support surface relative to said tool body.

4,414,871
CHUCK FORCE MODULATOR SYSTEM FOR ROTARY TYPE MACHINE TOOL

David H. Trout, Woodbury, Conn., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 3, 1981, Ser. No. 327,078
Int. Cl.³ B23B *31/30*
U.S. Cl. 82—40 R **4 Claims**



1. A chuck force control and compensating means for a rotary machine tool or the like having a power operated rotary chuck with radially movable gripping element, which comprises
(a) an hydraulic supply system for said chuck,
(b) an electrically controlled servo valve in said supply system for regulating the fluid pressure delivered to said chuck in accordance with an electrical input to said servo valve,
(c) a first electrical signal generator operative to provide an output signal corresponding to a function of the desired gripping pressure,
(d) a second electrical generator operative to provide an output signal corresponding to a function of the speed of rotation of said chuck,
(e) combining circuit means for effectively summing the outputs of said first and second signal generators and directing the combined signal to said servo valve,
(f) a pressure transducer in said hydraulic supply system for generating a feedback signal as a function of pressure delivered by said servo valve,
(g) comparator circuit means for comparing the outputs of said pressure transducer and said combining circuits, and
(h) fault circuit means connected to said comparator circuit for outputting a fault condition in response to a consequential difference in signals from said pressure transducer and said combining circuit means.

4,414,872
LENS TAPE CUTTER

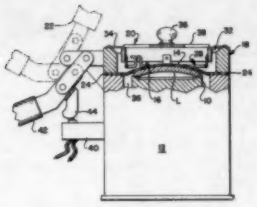
George D. Bard, Brooklyn, Conn., and Robert J. Dusza, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 29, 1981, Ser. No. 258,720
Int. Cl.³ B26F *3/12*
U.S. Cl. 83—171 **2 Claims**

1. An apparatus for severing excess tape at the edges of a lens surface which has been covered with tape comprising:
a base, said base including a lens support;
a length of electrical heating wire formed in the shape of said lens, said lens-shaped wire having a diameter approximately the same as that of said lens;
a sleeve made of dielectric material, said sleeve supporting said lens-shaped wire;

a housing for said sleeve, said housing pivoting between a position away from said lens support and a position in which said housing covers said lens support;

at least two leaf springs, said at least two leaf springs suspending said sleeve from the upper surface of said housing;



an operating knob, said operating knob connected to a support, said support being fixed to said sleeve;

means for energizing said lens-shaped wire;

whereby when said ring is pivoted to a position covering said lens and said operating knob is depressed, said excess tape is severed from said tape covering said lens by said wire.

4,414,873

DRIVING UNIT FOR THE KNIFE HOLDERS OF CROSS CUTTERS OR THE LIKE

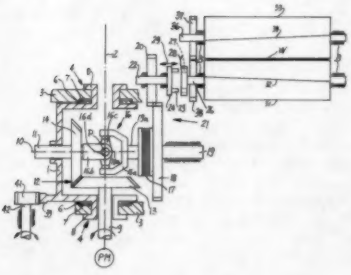
Alfred Besemann, Hamburg, and Willi Rehwald, Böblingen, both of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 275,663

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024603

Int. Cl.³ D06H 7/02

U.S. Cl. 83—311 **12 Claims**



1. A driving unit for a rotary member in a cross cutter for running webs of paper or the like, comprising an angle drive having a rotary input element and a rotary output element receiving torque from said input element; means for rotating said input element; a universal joint including a rotary input shaft constituting the output element of said angle drive and having a first axis and a rotary output shaft driven by said input shaft and having a second axis intersecting said first axis at a predetermined point, one of said shafts being movable with reference to the other of said shafts to thereby change the angle between said axes and said input element having a third axis intersecting said first and second axes at said point; carrier means rotatably mounting said input shaft and turnable about said third axis; and means for transmitting torque from said output shaft to the rotary member of the cross cutter.

4,414,874

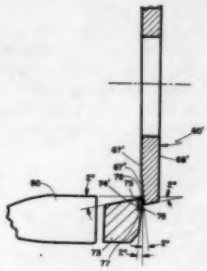
FABRIC CUTTING

Thomas E. Barnes, Bloomington, Ind., and Clifford A. Landsness, Akron, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,356

Int. Cl.³ B26D 1/18, 1/20

U.S. Cl. 83—488 **5 Claims**



1. A cutting apparatus for cutting rubberized fabric with cords disposed therein comprising a support frame, a carriage mounted on said support frame for reciprocal movement, drive means connected to said carriage for reciprocating said carriage, a cutter support member mounted on said carriage, a cutter means journaled on said cutter support member for rotation thereon, power means mounted on said carriage operatively connected to said cutter means for continuously rotating said cutter means, said cutter means having a pair of said surfaces, one of said side surfaces having an outer perimeter defining a first convex polygon with a plurality of apexes and a plurality of linear cutting edges, the other of said side surfaces having an outer perimeter defining a second convex polygon, the outer circumferential surface of said cutter means between said polygons being a plurality of flat surfaces that taper inwardly from said first convex polygon towards said second convex polygon, anvil means mounted on said cutter support member for movement therewith, said anvil means having a linear cutting edge cooperative with successive linear cutting edges of said first convex polygon presented to said anvil means by rotation of said cutter means, said linear cutting edge of said anvil means being defined by the intersection of the edges of an anvil upper surface and an anvil forwardly disposed surface, said anvil upper surface and said anvil forwardly disposed surface being tapered away from their intersection such that said surfaces subtend an acute angle.

4,414,875

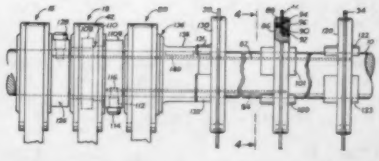
GANG SAW APPARATUS

H. C. Pearson, Beaverton, Oreg., assignor to Portland Iron Works, Portland, Oreg.

Filed Jul. 27, 1981, Ser. No. 287,181

Int. Cl.³ B27B 5/34

U.S. Cl. 83—508.3 **5 Claims**



1. In saw apparatus including an elongate power-driven saw

arbor and a collar adapted to mount a saw encircling said arbor and slidable axially on said arbor,

a channel extending axially of the arbor, and

means for shifting said collar to and fro on said arbor which, with rotation of the collar and arbor, results in centrifugal force producing positioning of the collar in a plane normal to said arbor,

said shifting means comprising a rigid compression-transmitting shifter bar seating within said channel, and

an attachment of said collar with said shifting means consisting of means connecting said bar with a portion of said collar disposed radially outwardly of said bar with the collar otherwise free of said shifting means, said attachment providing a single anchoring connection of the collar to the shifting means which anchoring connection, with rotation of the arbor, rotating in a path occupying a plane normal to the arbor's axis.

4,414,876

CHAIN SAW FOR TREE CUTTING PINION TO BE USED IN COMBINATION WITH THE CHAIN, AND PROCESS FOR MAKING THE CHAIN

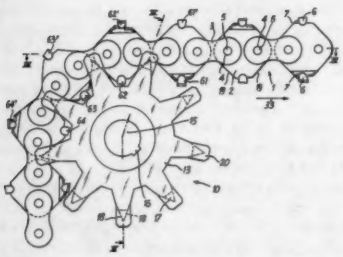
Jean Loigerot, Paris, France, assignor to Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere, Paris, France

Filed Mar. 9, 1981, Ser. No. 241,860

Claims priority, application France, Mar. 14, 1980, 80 05774

Int. Cl.³ B27B *33/14*

U.S. Cl. 83—830 **7 Claims**



1. A guideless saw chain for a tree cutting device without a guide bar, for sawing from either side of the longitudinal axis of the chain, said saw chain comprising, a series of cutting links, means pivotally connecting the cutting links together to form an endless chain having a plane extending through the series of cutting links, each of said cutting links comprising, a first tooth on one side of said longitudinal axis and a second tooth on the other side of said longitudinal axis, said cutting links being so connected in series that the chain has, on each side of its longitudinal axis, successively, a tooth displaced to one side of said plane, a tooth in said plane, a tooth displaced to the other side of said plane, a tooth in said plane, and so forth, along substantially the entire length of the chain.

4,414,877

MUSICAL DOOR CHIME PREFERABLY ALSO COMBINED WITH A CLOCK FOR ANNUNCIATING THE TIME

Waller M. Scott, Jr., West Chester, Ohio, assignor to Scovill Inc., Waterbury, Conn.

Division of Ser. No. 100,163, Dec. 4, 1979, Pat. No. 4,326,276. This application Dec. 24, 1981, Ser. No. 334,321

Int. Cl.³ G10H *3/00, 1/02*

U.S. Cl. 84—1.13 **5 Claims**

1. An audible frequency tone generator comprising:

a memory for storing a digitally encoded representation of the frequency and the duration of at least one musical note;

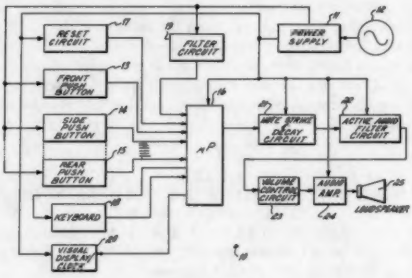
a tone generation means connected to said memory for converting said digitally encoded musical note representation for said at least one musical note into a squarewave having said frequency and said duration of said at least one musical note; and

circuit means connected to said tone generation means and responsive to said at least one squarewave for playing a pleasing sound of said at least one musical note;

said circuit means including a note strike and decay circuit connected to said tone generation means, said note strike and decay circuit comprising:

(a) a first capacitor connected between a charging circuit controlled by said tone generator means and common, said charging circuit being activated for charging said first capacitor at the time said at least one musical note is to be played;

(b) a first resistor connected at one end to said first capacitor;



(c) a second capacitor connected between the other end of said first resistor and common;

(d) a second resistor connected at one end to the junction of said first resistor and second capacitor and connected at the other end to the squarewave output of said tone generation means; and

(e) a third capacitor connected between the squarewave output of said tone generation means and common;

said first capacitor discharging over said duration of said at least one musical note for producing a decay envelope whose shape is determined by the time constant of said first capacitor and said first and second resistors and said frequency of said squarewave, the shape of the voltage within said decay envelope being determined by the charging of said second capacitor from said first capacitor through said first resistor and the discharging of said second capacitor through said second resistor, third capacitor, and squarewave output of said tone generation means.

4,414,878

TONE DATA COMPRESSING AND EXPANDING SYSTEM FOR DIGITAL ELECTRONIC MUSICAL INSTRUMENT

Tsuyoshi Mitarai, Yokohama, and Takeshi Yamaguchi, Kodaira, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 331,973

Claims priority, application Japan, Dec. 27, 1980, 55-188787

Int. Cl.³ G10H *1/057, 1/06, 1/46*

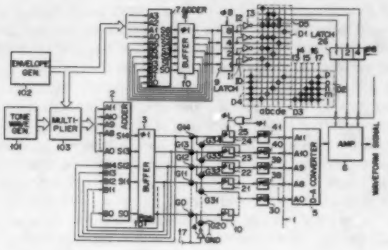
U.S. Cl. 84—1.19 **6 Claims**

1. In a digital electronic musical instrument of the type including means for forming digital tone data, means for forming envelope data for controlling the envelope of said digital tone data, means for combining the digital tone data and envelope data to obtain envelope controlled digital composite tone data, and a digital-to-analog converter having a certain number

of inputs for converting said ditigal composite tone data into an analog waveform signal,

a tone data compressing and expanding system including:

means responsive to said envelope data forming means for setting a level of bit shift for the digital composite tone data before the digital composite tone data is supplied to the digital-to-analog converter according to the envelope data and for providing a corresponding output, and



control means for supplying the digital composite tone data to the inputs of said digital-to-analog converter after the digital composite tone data is bit shifted by a number of bits corresponding to the output of said setting means, wherein compression and expansion of the tone data according to said envelope data are effected by the bit shift operation.

4,414,879

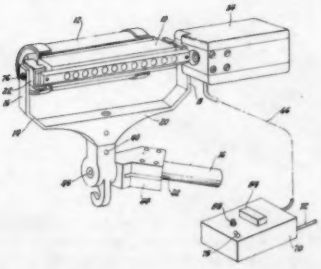
CHROMATIC HARMONICA WITH REMOTE ACTUATOR

Joseph Ruiz, 11368 Braile, Detroit, Mich. 48228

Filed Mar. 11, 1982, Ser. No. 356,945

Int. Cl.³ G10D *9/00*

U.S. Cl. 84—379 **4 Claims**



1. In combination with an elongated chromatic harmonica having a movable valve member operative to change the harmonica so as to provide either sharp or flat tones depending upon the position of the valve member;

a yoke having a pair of arms for receiving the harmonica between them, and a base including a first arm and a second arm;

means for connecting the first arm to one end of the harmonica, and means for connecting the second arm to the opposite end of the harmonica such that the harmonica is supported between said arms;

a housing and means for mounting the housing on the yoke adjacent the valve member;

an electrically actuated solenoid mounted in said housing, the solenoid having a movable magnetic plunger, and lever means mounted on said housing between the valve member and the solenoid plunger such that the valve member is moved from a first position to a second position as the solenoid is electrically energized;

a foot support;

a source of electrical energy and an elongated flexible electrical connector mounted between the solenoid and said source of energy; and

switch means mounted on the foot support and connected in the electrical connector means between the source of electrical energy and the solenoid such that the valve member is moved in response to a predetermined motion of the switch means.

4,414,880

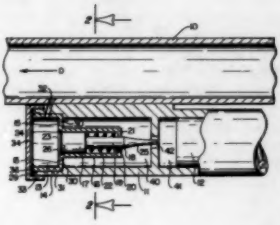
GAS REGULATED COMPENSATING VALVE MECHANISM FOR FIREARMS

Guy C. Thruner, Upper Arlington, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Jan. 5, 1982, Ser. No. 337,182

Int. Cl.³ F41D *5/08*

U.S. Cl. 89—193 **7 Claims**



1. A compensating valve for a firearm with a gas operated loading mechanism comprising:

a. A gas pressure sensing first chamber means in fluid communication with a head end of a regulator first piston, which is reciprocally retained in a cylinder and biased for movement in one direction by an elastic means and biased in the opposite direction by the gas pressure in the first chamber, the first piston having a portion forming a stem of variable cross-section on the opposite end to the head end;

b. a gas regulating second chamber in gas fluid communication with the first chamber and having an orifice coaxial with the stem, the stem being positioned in the orifice, and the orifice providing communication between the second chamber and a third chamber operably containing a second piston which is connected to the loading mechanism of the firearm; and

c. the stem having an elongated tapered end portion longitudinally moveable and positionable in the orifice according to pressure variations in the first and second chambers, thereby regulating the rate of gas flow and pressure in the third chamber.

4,414,881

HYDRAULIC CONTROL DEVICE

Gerard L. Devaud, Paris, France, assignor to Societe d'Applications des Machines Motrices, Issy-les-Moulineaux, France

Filed Jan. 21, 1981, Ser. No. 227,111

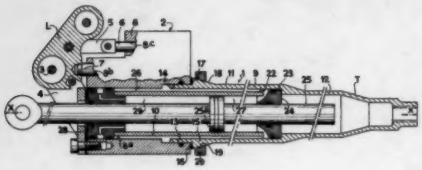
Claims priority, application France, Jan. 25, 1980, 80 01592

Int. Cl.³ F01B *15/00*; F16J *11/04*

U.S. Cl. 91—216 R **6 Claims**

1. A hydraulic control device for helicopters and aircraft of the type comprising a cylinder device (1) having a cylinder and a piston (25*a*) rigid with a rod (25), and a hydraulic control unit (2) having a body which is rigid with the cylinder, the body (8) of the hydraulic control unit defining a cavity for receiving the

cylinder of the cylinder device, and said cylinder comprising two main parts, namely a case (9) fixed to the body of the hydraulic control unit, and a tubular sleeve (10) which is positioned axially and radially inside the case and the cavity and cooperates with the piston, wherein the case and the cavity each contain an end member (24, 28) which has a cylindrical bearing surface and a radial shoulder and defines with the sleeve and the piston two chambers (27, 29) of the cylinder device, the sleeve being fitted on the cylindrical surfaces of said two end members and bearing axially against the two



radial shoulders of said end members, the sleeve being subjected to an axial compressive pre-stressing force when fixing the case to the body of the hydraulic control unit, wherein the piston and rod are fixed such that the selective application of pressurized hydraulic fluid to one of the two chambers causes movement of the hydraulic control unit body and the case fixed thereto, and wherein the case has an outer flange (15) which defines a substantially radial surface (16) bearing against an adjacent surface (17) of the unit, and a frustoconical surface (18) on which is engaged a surface (19) of complementary shape of a flange (20) for fixing to the unit.

4,414,882

PNEUMATIC DRIVE FOR SWITCHING ELEMENTS AND CONTROL ELEMENTS

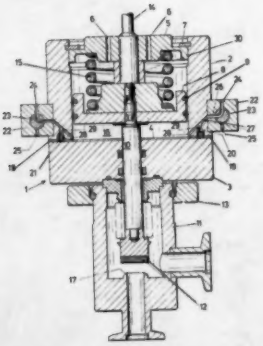
Willi Frei, Sennwald, Switzerland, assignor to VAT Aktiengesellschaft für Vakuum-Apparate-Technik, Haag, Switzerland

Filed May 19, 1981, Ser. No. 265,158

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019119

Int. Cl.³ F01B *3/10*

U.S. Cl. 91—442 **5 Claims**



1. A pneumatic drive for actuating switchable devices such as valves and the like, comprising an axially extending cylinder and a cylinder base which together form a cylinder space in the interior of said cylinder, said cylinder having an annular slot which extends in a plane transverse to the axis of said cylinder between said cylinder space and the exterior of said cylinder closely adjacent said cylinder base, said annular slot being bounded in the axial direction by two opposed annular surfaces at least one of which is formed by said cylinder, a piston arranged for movement within said cylinder space in the axial direction of said cylinder, a piston rod connected to said piston for actuating a switchable device coupled at one end of said piston rod in response to movement of said piston, a supply line extending through one of said cylinder and said cylinder base and having an inner opening for communicating a pressurized gas to said cylinder space to move said piston away from said cylinder base, means for applying a bias force to said piston in the direction toward said cylinder base, valve means coupled to said supply line for venting said supply line to the exterior of said cylinder, a branch line connected at one end to said supply line between said inner opening and said valve means, an annular groove formed in one of the said annular surfaces so that said groove opens toward the opposed annular surface and extends in the axial direction of said cylinder to a closed end region, the other end of said branch line being connected to said closed end region of said annular groove, and a sealing ring coaxially seated in said annular groove for movement in the axial direction of said sealing ring and said cylinder to seal said annular slot when pressurized gas is communicated to said cylinder space and said branch line wherein said sealing ring is urged to project into said annular slot in response to pressurized gas which enters said end region of said annular groove from said branch line.

4,414,883

POWER-ASSISTED STEERING DEVICE

Jean L. R. Dauvergne, 6 rue Maryse Hilsz, 95470 Fosses, France

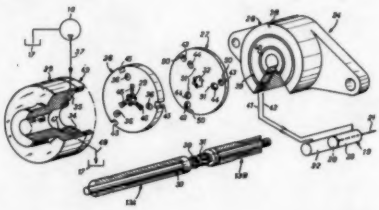
Filed Feb. 1, 1980, Ser. No. 117,483

Claims priority, application European Pat. Off., Feb. 8, 1979, 79400085.1

The portion of the term of this patent subsequent to Mar. 10, 1998, has been disclaimed.

Int. Cl.³ F15B *9/12*

U.S. Cl. 91—467 **5 Claims**



1. In a power-assisted steering device for a vehicle, comprising control means acting on steering means, said control means incorporating a transmission element in two parts which parts are capable of limited relative angular displacement under the action of the said control means, and auxiliary assistance means operable to act on the steering means in the same direction as the control means in response to said relative angular displacement, the said auxiliary assistance means comprising a hydraulic power system including means for pressurizing a hydraulic fluid and a fluid reservoir, a hydraulic actuator acting on the said steering means, and a hydraulic distributor interposed between the power system and the actuator, the said distributor comprising an axially-stacked assembly composed of a first stator, a first rotor plate integral in rotation with one of said two parts of the transmission element, a second rotor plate integral in rotation with the other said part of the transmission element, and a second stator, said assembly comprising said first stator, said first rotor, said second rotor and said second stator stacked in side-by-side relationship with their side faces contiguous to each other, the said rotor plates having a series of hydraulic passages for feeding and returning fluid to and

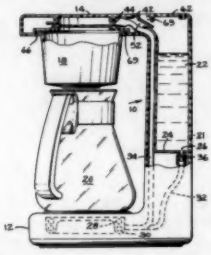
from the actuator by the power system via the stators; the improvement comprising at least one pressure-equilibrating channel, in which no liquid circulates, in at least one of the rotors, said channel emerging through at least one of the faces of this rotor in an occluded region of at least one of the adjacent faces of the rotor and stator that are on opposite sides of said at least one rotor.

4,414,884

COFFEEMAKER WITH COFFEE SPREADER

James O. McLean, Milford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 10, 1982, Ser. No. 356,856
Int. Cl.³ A47J *31/057*
U.S. Cl. 99—304 **9 Claims**



1. In an electric drip brewing apparatus having an upright C-shaped housing, the lower horizontal leg having a heated carafe support and the upper leg having a water spreader over a supported coffee basket, the vertical leg enclosing a reservoir with an apertured bottom wall, and a cover over the upper leg with an opening to the reservoir, a pump and heating chamber in the lower leg with a connected tube delivering hot water through a central portion to the spreader, an improvement in said spreader comprising,

an open cup-shaped member having a central enclosed portion connecting with said reservoir and having a raised cut-away side towards the reservoir and connected to said tube,

apertures in said cup dispensing hot water to the basket,

overflow means in said cup,

ribs on said cover coextensive with and making a closure for spreader and cut-away side and, with the cover and central portion, forming separate passage means away from the spreader for venting steam,

whereby the spreader is closed and vented by the cover to reduce condensing and dripping at the spreader.

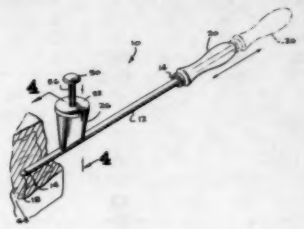
4,414,885

FLAVOR INJECTOR

Harry C. Kelly, 4225 Colorado Ave., N.W., Washington, D.C. 20005

Filed Jun. 29, 1982, Ser. No. 393,410
Int. Cl.³ A23B *4/02*; A23L *1/22*
U.S. Cl. 99—494 **1 Claim**

1. In a flavor injector device for introducing a composition or additive internally into a body of meat and the like, said device consisting solely of a tube hollow throughout its entire length and having a generally constant diameter, a projecting rod enclosed by the tube in generally telescopic relation thereto, a reservoir mounted perpendicularly and in securement at an intermediate portion of the hollow tube and the interior of the reservoir being in communication with said hollow tube in air tight relation, the reservoir adapted for holding a predetermined quantity of additive or seasoning composition, the projecting rod being displaceable along the hollow tube into insertion relation with said body of meat and the like, and wherein clogging is prevented in said tube by said projecting rod; a cover disposed on the reservoir at a point distal from the communication of the reservoir with the hollow tube; an axially extending shaft mounted plunger slideably mounted on the cover and being spring-biased away from the hollow tube by spring means retained between the cover and a handle on the shaft; said cover having a generally circular configuration throughout; said reservoir being secured onto said hollow tube; the outer surface of the projecting rod containing indicia marks indicative of volume of additives or composition to be inserted into the body of meat and the like, the projecting rod being pointed for piercing a food project, a shaft mounted plunger extending through said cover; the plunger having a generally semi-cylindrical contour for packing and projecting additives or composition into the hollow tube; and said shaft mounted plunger being in slideable engagement with a mounting sleeve, and the sleeve being mounted on a plate secured to the cover.

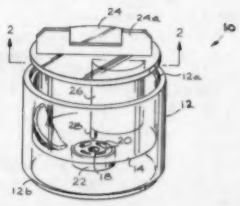


4,414,886

FRUIT SQUEEZER

Louis P. Gonzales, 21114 S. Pioneer Blvd. #201, Lakewood, Calif. 90715, and Dennis M. Long, 1202 Le Gray Ave., Los Angeles, Calif. 90042

Filed Nov. 26, 1979, Ser. No. 97,558
Int. Cl.³ A23N *1/00*
U.S. Cl. 99—495 **5 Claims**



1. A fruit squeezer, comprising:

(a) A circularly shaped container, including a dished bottom, arranged off-set from the lower edge of the wall of the container and having a center opening, surrounded by a plurality of outlet apertures for the juice squeezed from the fruit, the upper and lower edges of the wall of the container being recessed to form inversely directed shoulders, capable of nestling within the lower and upper edges, respectively of additional containers for stacking purposes;

(b) A collar-shaped spout extending downwardly from the underside of and encompasses the apertures in the bottom of the container;

(c) A plurality of elongated vertically directed ribs extending from the interior wall of the container;

(d) A circularly shaped lid, rotatably mounted in the shoulder of the upper edge of the container wall, including a handle having a centered cut-out, extending upwardly

from and along a portion of the diameter of the lid, a portion of the shoulder of the upper container edge protrudes above the surface of the lid so that the shoulder of the lower edge of another container may be stacked thereon, abutting the protruding upper container edge and the surface of the lid, with its spout fitting within the cut-out of the handle of the underlying container;

(e) A semi-circular block extending, from the center of the underside and along a portion of the radius of the lid, vertically downward, abutting the bottom of the container, and terminates in a pin-shaped projection, being rotatably insertable in the center opening of the bottom of the container, said semi-circular block will, when the lid of the container is rotated thereon, co-act with the ribs, extending from the container wall, causing juice to be pressed from a fruit placed within the container.

4,414,887

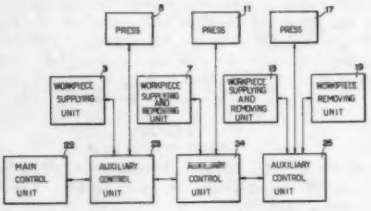
PRESS SECONDARY MACHINING LINE CONTROL DEVICE

Takeshi Orii, Isehara, Japan, assignor to Kabushiki Kaisha Orii Jidoki Seisakusho, Japan

Filed Mar. 2, 1982, Ser. No. 353,993

Int. Cl.³ B30B *15/30*

U.S. Cl. 100—45 **1 Claim**



1. A control device of a press secondary machining line, which comprises:

a main control unit; and

auxiliary control units which are operatively coupled to said main control unit and provided respectively in operation blocks which are obtained by dividing a press secondary machining line in such a manner that each operation block includes a press, each auxiliary control unit controlling a press and a workpiece supplying and/or removing unit in the respective block in response to a signal from said main control unit,

said main control unit comprising: a shift signal transmitting circuit for transmitting a shift signal; a workpiece conveyance signal transmitting circuit for transmitting a workpiece conveyance signal; a press operation signal transmitting circuit for transmitting a press operation signal; and a data switching circuit for transmitting data at a logic level "1" at the start of a press machining operation and during the press machining operation, and for transmitting data at a logic level "0" at the end of the press machining operation,

each auxiliary control unit comprising: a shift register for loading input data in response to said shift signal from said shift signal transmitting circuit; a conveyance signal receiving circuit for receiving said workpiece conveyance signal from said workpiece conveyance signal transmitting circuit when said shift register provides an output at a logic level "1;" a press operation signal receiving circuit for receiving said press operation signal from said press operation signal transmitting circuit when said shift register provides the output at the logic level "1;" and a shift register clear circuit for clearing the output at the logic level "1" of said shift register,

data input terminals and output terminals of said shift registers in said auxiliary control units being connected in series to said data switching circuit in said main control unit.

4,414,888

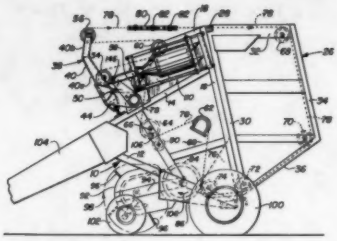
BALING MACHINE WITH AIR SPRING MEANS FOR MAINTAINING APRON TENSION

Willis R. Campbell, Ephrata, and Franklin A. Oellig, Leola, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Dec. 21, 1981, Ser. No. 333,204

Int. Cl.³ B30B *5/02, 5/06*

U.S. Cl. 100—88 **2 Claims**



1. In a roll baling machine having a frame, apron means supported on said frame for forming a roll bale of crop material, an arm assembly mounted on said frame supporting part of said apron means, said arm assembly rotating from a first position to a second position during bale formation, the improvement comprising:

(a) air spring means urging said arm assembly toward said first position while resisting movement of said arm assembly toward said second position in order to maintain tension in said air spring means, said air spring means including an air bag for containing air under pressure and a piston movable into said air bag to increase the air pressure therein;

(b) first means pivotally connecting said air spring means to said arm assembly, said first means including a bar member rigidly connected at one end to said piston and pivotally connected at the other end to said arm assembly;

(c) second means rigidly connecting said air spring means to said frame, said second means including a bracket member rigidly connected to said air bag and to said frame;

(d) guide rods connected to said bar member and extending through said bracket member; and

(e) guide holes in said bracket member slidably receiving said guide rods, and the clearance between said guide rods and said guide holes being sufficient to allow rocking movement of said piston, said bar member and said guide rods as said arm assembly is rotated between said first and second positions.

4,414,889

ROLLING DEVICE

Heinz Güttinger, Winterthur, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Jun. 23, 1981, Ser. No. 276,534

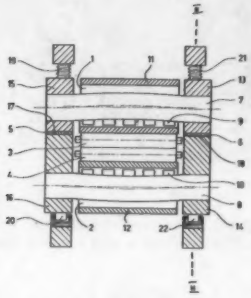
Claims priority, application Switzerland, Aug. 14, 1980, 6133/80

Int. Cl.³ B30B *3/04*

U.S. Cl. 100—162 B **8 Claims**

1. A rolling device comprising a roller stand and two press rollers mounted on parallel axes between side panels of the stand, at least one of which rollers has an axial support with support elements upon which a roller shell is rotatable about the support, the roller shell being displaceable relative to the axial support in the plane containing the roller axes, wherein the axial support of said one roller extends beyond both ends of

the shell and has portions fixed in the side panels so as to be immovable with respect to the panels, whereby the side panels and the support portions form a force-locked construction



which gives to the support the character of a beam with fixed ends and thereby enhances the bending resistance of the support.

4,414,890

PRESS ROLL WITH ADJUSTABLE FLEXION

Christian Schiel, Heidenheim, and Robert Wolf, Herbrechtingen, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

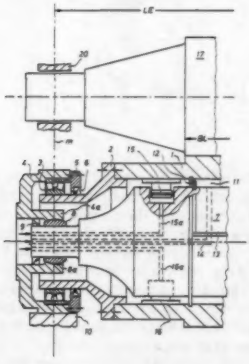
PCT No. PCT/EP81/00085, § 371 Date Feb. 22, 1982, § 102(e) Date Feb. 22, 1982, PCT Pub. No. WO82/00165, PCT Pub. Date Jan. 21, 1982

PCT Filed Jun. 26, 1981, Ser. No. 355,571

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024575; Dec. 24, 1980, 3049080

Int. Cl.³ B30B *3/04*

U.S. Cl. 100—162 B **20 Claims**



1. A press roll with adjustable flexion for applying pressure in cooperation with a mating roll:

the press roll comprising:

a longitudinally extending yoke; a hollow shell around the yoke; the shell having first opposite ends;

a self-aligning bearing at each first end of said shell for supporting the shell for rotating around the yoke and for holding the shell away from the yoke;

the mating roll being adjacent the press roll; both the press roll and the mating roll having parallel rotation axes; both rolls together defining a press nip; the press nip and the roll axes being in a press plane; the mating roll having second opposite ends and being supported at the second opposite ends by respective mating roll bearings;

the press roll yoke having third opposite ends; and support cap for each third end of the press roll yoke for supporting the yoke in position; at each third end, the yoke including a supported area which is supported by the respective support cap; each support cap including a collar extending into the interior of the hollow shell from the respective first end at which that support cap is positioned and the respective supported area of the yoke sitting on the respective collar;

the longitudinal distance between the center planes of the supported areas of the yoke, which planes are perpendicular to the rotation axes of the rolls, is at most as great as the distance between the mating roll bearings;

the distance between the self-aligning bearings of the roll shell is at least approximately the distance between the mating roll bearings.

4,414,891

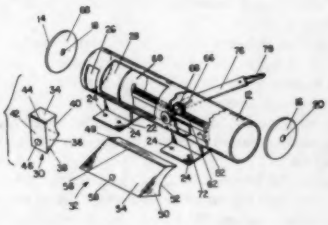
CRUSHING APPARATUS

Donald G. Kitzman, 2004 W. 16th, Pueblo, Colo. 81003

Filed Jul. 6, 1981, Ser. No. 280,948

Int. Cl.³ B30B *1/24*

U.S. Cl. 100—245 **15 Claims**



1. A crushing apparatus comprising:

an elongated hollow housing having a surrounding sidewall and a first endwall defining a fixed crushing surface, said sidewall having a first opening adjacent said first endwall and a second opening longitudinally spaced from said first opening;

a piston assembly mounted for reciprocal motion in said housing and including a drive shaft oriented parallel to the axis of said housing and a crushing head attached to an end of said drive shaft facing said fixed crushing surface and defining a movable crushing surface, said drive shaft including a flat wing of reduced thickness projecting outwardly therefrom and extending substantially the full length of said drive shaft;

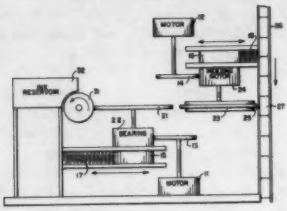
a pair of guide brackets each secured along one edge to said sidewall and having flat surfaces oriented in parallel relation to one another on either side of said flat wing, said guide brackets each having an edge opposite its respective said one edge that terminates in closely spaced parallel relation to said drive shaft, said guide brackets operative to support and guide said drive shaft during its reciprocal movement; and

drive means associated with said drive shaft for reciprocally moving said crushing head between a first location adjacent said fixed crushing surface and second location on a side of said second opening opposite said first opening whereby said movable crushing surface is movable completely past the longitudinal length of said second opening.

4,414,892
OFFSET PRINTING

Nicholas Strafello, 150 Charles St., Malden, Mass. 02148

Filed May 17, 1982, Ser. No. 379,053
Int. Cl.³ B41F 17/00
U.S. Cl. 101—44 6 Claims



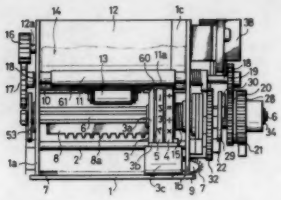
1. Offset marking apparatus comprising,
print wheel means for receiving marking fluid,
marking wheel means for receiving marking fluid from said print wheel means and transferring it to a component to be marked,
means for supporting said print wheel means and said marking wheel means for relative displacement between a first position when said print wheel means and said marking wheel means are in contact and a second position when said print wheel means and said marking wheel means are separated,
marking fluid delivery means for delivering marking fluid to said print wheel means when in said second position,
window means for receiving said marking wheel means when in said second position,
means for relatively displacing said print wheel means and said marking wheel means between said first and second positions,
and means for angularly displacing said print wheel means and said marking wheel means when in said first position to transfer marking fluid from said print wheel means to said marking wheel means,
said means for relatively displacing said print wheel means and said marking wheel means comprising,
means for supporting said print wheel means and said marking wheel means for relative translational motion,
spring means acting on said means for supporting for urging said print wheel means and said marking wheel means toward one of said first and second positions,
and means acting on said means for supporting for urging said marking wheel means and said print wheel means toward the other of said first and second positions.

4,414,893
SERIAL PRINTER

Fumihisa Hori; Tadao Tamukai, both of Tamayama, and Mikio Miyajima, Nishine, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1980, Ser. No. 178,891
Claims priority, application Japan, Aug. 20, 1979, 54-105673
Int. Cl.³ B41J 9/04
U.S. Cl. 101—93.15 14 Claims

1. A printer including a type wheel carrying a plurality of type elements and a blank portion around respective areas of its circumference, means including a rotatable shaft held to said type wheel for positioning a selected area of said type wheel in a printing position along a line to be printed, impact means including a printing hammer located along said line to be printed for pressing a record member between said type wheel and said printing hammer, return means connected to said type wheel for moving said type wheel along said printing line to print selectively along said line, means connected to said type wheel for returning said type wheel to its initial position, and

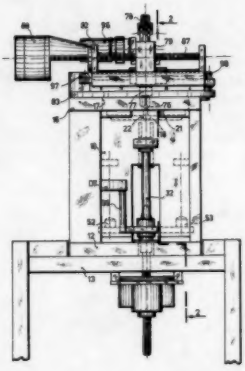


means operating said return means by actuation of said impact means with said blank portion in said printing position.

4,414,894
SCREEN PRINTING APPARATUS

Emile Bailly, Les Lilas, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Mar. 10, 1978, Ser. No. 885,153
Claims priority, application France, Mar. 10, 1977, 77 07044
Int. Cl.³ B41F 15/08
U.S. Cl. 101—123 6 Claims



1. Apparatus for printing onto a carrier by applying material to the carrier through a screen comprising support means for the screen, support means for the carrier, said carrier support means including a platen, said carrier support means being movable relative to said screen support means, and positioning means for controlling relative movement between the carrier and screen support means, said positioning means including: (1) guide means for providing translation in generally parallel planes between the carrier support means to control translation of the carrier support means toward and away from the screen support means, and (2) means for stopping the translation between said carrier support means and screen support means, said stopping means being coupled to said screen support means and said carrier support means, said stopping means positioning said platen and screen in predetermined substantially parallel planes where the material can be applied through the screen onto the carrier, said positioning means further comprising centering means coupled to said platen and said screen support means for centering said platen and said screen relative to each other, the screen having a pattern including a number of lines substantially parallel to a first predetermined direction, a blade having an elongated straight edge positioned for forcing the material through the screen onto the carrier, blade supporting and actuating means for displacing the blade

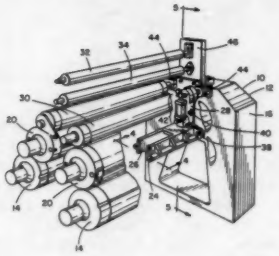
edge in a plane parallel to the plane of the screen and in a second direction, said blade supporting and actuating means including means for adjusting said second direction to any angle with respect to said first direction, whereby the blade can slide parallel to said lines in the screen.

4,414,895

METHOD AND APPARATUS FOR CONVERSION OF A PRINTING PRESS TO OFFSET PRINTING

Michael A. Schwartz, Batavia, and Toshio Yamagata, Chicago, both of Ill., assignors to Press Machinery Corporation of Illinois, Bensenville, Ill.

Filed Jun. 19, 1981, Ser. No. 275,208
Int. Cl.³ B41F *7/04, 5/06, 13/40*
U.S. Cl. 101—177 **1 Claim**



1. In an apparatus for converting an existing, web-fed, newspaper printing press into a web-fed, offset, newspaper printing press, the existing, web-fed, newspaper printing press having an existing main frame of two spaced, main side frame members, and two existing pairs of horizontally spaced cylinders rotatably mounted on the main frame side members, and the apparatus including means for converting one pair of the two existing pairs of cylinders into offset plate cylinders and means for converting the other pair of the two existing pairs of cylinders into offset blanket cylinders, with a first of the offset blanket cylinders cooperating with a first of the offset plate cylinders, and a second of the offset blanket cylinders cooperating with a second of the offset plate cylinders, the improvement comprising:

a pair of auxiliary side frame members each mounted on one of the two spaced, main side frame members, each facing the other between the main side frame members and each including first and second offset impression cylinder mounting portions and an actuator mounting position;

a pair of auxiliary impression cylinders each having a dead shaft with a cylindrical central portion and two cylindrical end portions eccentric to the central portion, an annular, impression cylinder surface member having a cylindrical, outer, impression cylinder surface, and bearings for rotatably mounting the impression cylinder surface member on the central portion of the shaft;

a first of the pair of auxiliary impression cylinders being pivotably mounted by the end portions of the shaft thereof to the first offset impression cylinder mounting portions of the pair of auxiliary side frame members between the auxiliary side frame members and adjacent the first offset blanket cylinder, the first offset impression cylinder thereby being pivotable between a position, of the first offset impression cylinder surface, of offset impression contact with a web passed between the first offset impression cylinder and the first offset blanket cylinder, and a thrown-off position of no contact with the web, the first offset impression cylinder being friction driven by the web in the position of offset impression contact with the web;

a second of the pair of auxiliary impression cylinders being pivotably mounted by the end portions of the shaft thereof to the second offset impression cylinder mounting portions of the pair of auxiliary side frame members between the auxiliary side frame members and adjacent the second offset blanket cylinder, the second offset impression cylinder thereby being pivotable between a position, of the second offset impression cylinder surface, of offset impression contact with a web passed between the second offset impression cylinder and the second offset blanket cylinder, and a thrown-off position of no contact with the web, the second offset impression cylinder being friction driven by the web in the position of offset impression contact with the web;

first means for driving the first auxiliary impression cylinder in pivotal movement about the end portions thereof to move the impression cylinder surface to and from the offset impression contact and thrown-off positions, the first driving means including a first actuator arm mounted to one of the end portions of the shaft of the first auxiliary impression cylinder and a first actuator mounted to the first actuator arm and to the actuator mounting portion of one of the pair of auxiliary side frame members between the main side frame members of the press; and

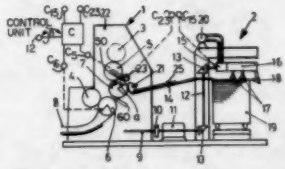
second means for driving the second auxiliary impression cylinder in pivotal movement about the end portions thereof to move the impression cylinder surface to and from the offset impression contact and thrown-off positions, the second driving means including a second actuator arm mounted to one of the end portions of the shaft of the second auxiliary impression cylinder and a second actuator mounted to the second actuator arm and to the actuator mounting portion of the other of the pair of auxiliary side frame members between the main side frame members of the press.

4,414,896

SHEET-FED ROTARY PRIME AND VERSO OFFSET PRINTING MACHINE & METHOD

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,235
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108807
Int. Cl.³ B41M *1/14;* **B41F** *5/16*
U.S. Cl. 101—211 **17 Claims**



1. Method of printing in prime and verso printing mode on a substrate sheet by a printing machine having

two plate cylinders (3,4; 41, 42);

two rubber blanket cylinders (5, 6; 43, 44) in continuous surface engagement with an associated respective plate cylinder;

a printing or impression cylinder (7, 45) carrying a rubber blanket capable of receiving printing information,

all said cylinders having essentially the same diameter comprising: controlling, respectively, engagement and disengagement of said rubber blanket cylinders and the impression cylinder by

(a) separating one (5) of the rubber blanket cylinders and the impression cylinder (7,45) during a first or printing phase of revolution of the impression cylinder while engaging a substrate sheet against the impression cylinder;

(a1) engaging said rubber blanket cylinder with the rubber blanket of the impression cylinder for transferring of printed information from the rubber blanket cylinder to the rubber blanket of the impression cylinder during a second phase of operation and when no substrate sheet is positioned between the rubber blanket cylinder and the impression cylinder to effect verso printing on said substrate sheet;

(a2) transferring printing information from the rubber blanket cylinder to the rubber surface of the impression cylinder by engagement of said rubber blanket cylinder (5, 43) with the impression cylinder (7, 45) during a second, or non-printing operating phase of the machine;

(b) engaging the other (6, 44) rubber blanket cylinder against the printing or impression cylinder (7, 45) with the substrate sheet therebetween for prime printing on said substrate sheet during said first operating phase;

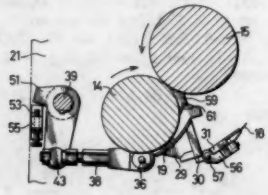
(b1) separating the other rubber blanket cylinder (6, 44) from the printing or impression cylinder (7, 45) during said second operating phase to prevent ink smear by the second rubber blanket cylinder on the printing information transferred to the rubber surface of the impression cylinder by the first rubber blanket cylinder (5,43).

4,414,897

INKING MECHANISM IN A ROTARY PRESS

Masayoshi Sato, Kawasaki, and Kunio Suzuki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 193,088, Oct. 2, 1980, abandoned. This application Jan. 18, 1983, Ser. No. 458,948
Claims priority, application Japan, Jun. 6, 1980, 55-076501
Int. Cl.³ B41F *31/00*
U.S. Cl. 101—216 **1 Claim**



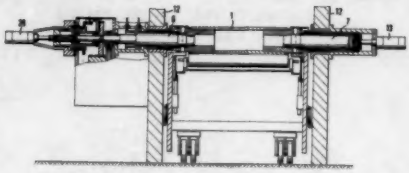
1. An inking mechanism in a rotary press comprising an ink pan, a fountain roll having a circumferential surface for drawing ink from the pan and transferring it to a circumferential surface of a mesh roll, a plate cylinder to which the ink is supplied from the mesh roll via a pair of form rolls, said mesh roll rotating at a high speed equal to that of the plate cylinder, a doctor blade which is provided on a base being traversed on arms swinging along the circumferential surface of eccentric sleeves supporting both ends of said fountain roll, a scraped ink returning plate provided close to and along the circumferential surface of the fountain roll which is swingable with said base, means for swinging a free end portion of the doctor blade between a contact position in which said free end portion of the doctor blade makes contact with a position just progressed in the rotative direction on that portion of the circumferential surface of the mesh roll to which ink is transferred from the fountain roll and a non-contact position in which said free end portion of the doctor blade is removed from the circumferential surface of the mesh roll along the circumferential surface of the eccentric sleeves, and means for pivoting and doctor blade at said non-contact position in a direction away from both of the circumferential surfaces of the mesh roll and the fountain roll.

4,414,898

MOUNTING FOR PRINTING CYLINDERS OR THE LIKE WITH ADJUSTABLE SIDE REGISTER

Jürgen Westerkamp, Westphalia, and Bruno Marquardt, Georgsmarienhütte, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,317
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126561
Int. Cl.³ B41F *13/24*
U.S. Cl. 101—248 **9 Claims**



1. A mounting for printing cylinders or the like with an adjustable side register, wherein the cylinder having internal cones at the ends is clamped between complementary external cones of a shaft which is mounted in the machine frame and is mounted against axial displacement in a sleeve that has a screwthread and is axially displaceable by means of a screw connection to a sleeve which is axially undisplaceable with respect to the frame, characterised in that the external cones are disposed at the confronting ends of journals which are mounted in the frame and of which one is mounted against axial displacement in the sleeve which is axially displaceable but non-rotatable with respect to the machine frame, that the sleeve is screw-connected to an axially undisplaceable sleeve which is rotatable in the machine frame and provided with a rotary drive for adjusting the cylinder axially, and that the journals can be clamped towards each other by the piston rods of hydraulic piston-cylinder units of which the cylinder chambers, which have volumes varying in opposite senses when the side register is adjusted, can be interconnected.

4,414,899

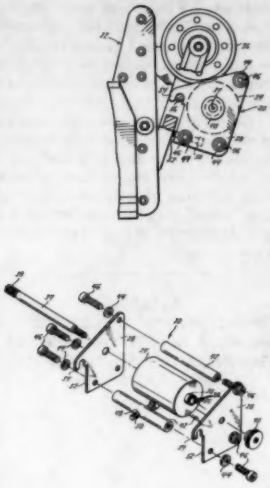
INK ROLLER ASSEMBLY ATTACHMENT

Forrest G. Hill, Belleville, Ill., assignor to Marsh Stencil Machine Company, Belleville, Ill.

Filed Mar. 29, 1982, Ser. No. 362,609
Int. Cl.³ B41K *1/22*
U.S. Cl. 101—331 **6 Claims**

1. An ink roller assembly for attachment to a tape printer or the like to replace the transfer roller thereof, the tape printer having a print wheel and a transfer roller in operational contact with the print wheel to apply ink thereto, said transfer roller being axially mounted on a shaft, the ink roller assembly replacing the transfer roller in the tape printer and having a pair of hanger brackets for suspending the ink roller assembly from the transfer roller shaft of the tape printer when said transfer roller has been removed, said ink roller assembly further including a pre-inked roller rotatably mounted on a shaft, said shaft being mounted solely to and between said

hanger brackets, and said ink roller assembly having means to urge the ink roller against the print wheel when said ink roller



assembly is mounted, said ink roller assembly thereby replacing the transfer roller.

4,414,900

NON-LEAKING PRINTING INK TROUGH

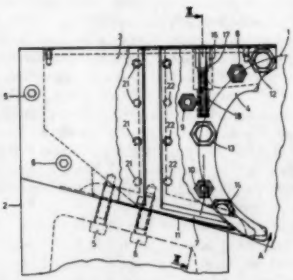
Josef Kraus, and Erich Wech, both of Augsburg, Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,218

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043234

Int. Cl.³ B41F *1/46, 31/02*

U.S. Cl. 101—363 **8 Claims**



1. Non-leaking printing ink trough construction having an elongated cross element (2);
an ink duct roller (1) extending parallel to the cross element and having an end face at each end;
a doctor blade (11) extending parallel to the ink duct roller;
a side wall positioned perpendicularly to the cross element, closing off the cross element laterally, and forming therewith an ink trough construction in engagement with the end faces of the duct rather, said side wall including a fixed wall portion (3) and an elastically movable wall portion (4) in engagement with a duct roller end face (1), the doctor blade (11) being longer than the duct roller (1) to form lateral projecting portions;
a resilient force means (18), coupled to the elastically movable wall portion (4) to press said elastically movable wall portion against the top face of the doctor blade (11);
and spring means (15) bearing on the elastically movable wall portion (4) of the side wall for pressing said elastically movable wall portion into engagement with an end face (A) of the duct roller (1),
said movable portion thus sealing
(a) against the end face (A) of the duct roller (1) and
(b) against the top face of the doctor blade (11)
to form a non-leaking end seal;
and a sealing element (7) which, in plan view, is essentially T-shaped, having a cross portion and a leg portion, said cross portion forming a seal between the fixed and the elastically movable wall portions of the side wall and the blade (11),
and the leg portion extending between and sealingly connecting said fixed portion and said elastically movable wall portion, while permitting movement of the elastically movable wall portion (4) with respect to the fixed portion (3) and movement of the elastically movable wall portion (4) in the direction of the leg portion of the sealing element (7).

4,414,901

EXPLOSIVE DEVICE INCLUDING AN IGNITION CIRCUIT MONITOR

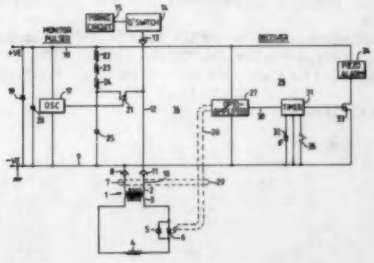
Raymund E. Sellwood, Slough, England, assignor to M.L. Aviation Company Limited, Slough, England

Filed Jun. 18, 1981, Ser. No. 274,739

Claims priority, application United Kingdom, Mar. 9, 1981, 8107359

Int. Cl.³ F42C *11/00*

U.S. Cl. 102—206 **6 Claims**



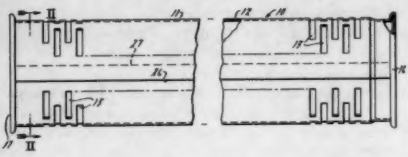
1. An explosive device, comprising an explosive charge; an igniter circuit including an electrically-energisable heating element for igniting the explosive charge; a firing circuit operable to feed electrical energy to the igniter circuit at a firing level sufficient to cause ignition of the explosive charge; a light-emitting diode connected in series with the heating element; and a monitoring circuit operable to feed electrical energy to the igniter circuit at a level less than said firing level and to monitor radiant energy produced by said light-emitting diode in order to check the integrity of the igniter circuit.

4,414,902

CONTAINER FOR GAS GENERATING PROPELLANT

Robert A. Strasser, Livonia, and Stephen W. Goch, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 29, 1980, Ser. No. 220,347
Int. Cl.³ F42B 5/20, 9/18
U.S. Cl. 102—531 2 Claims



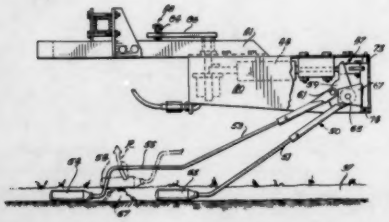
1. A container for a gas generating propellant comprising:
an elongated thin wall metal cylinder having a plurality of perforations extending substantially around the periphery of the cylinder and for substantially the length of the latter;
a hermetic liner sealingly attached to the imperforate portions of the inner surface of the cylinder to seal the perforated area of the wall;
the hermetic liner comprising a laminated plastic film and metal foil composite having a thickness less than that of the cylinder wall and being rupturable under the pressure of gas generated within the cylinder;
the laminated plastic film and metal foil composite including a first layer of an ionomer resin film, a layer of aluminum foil, a second layer of ionomer resin film, and a layer of polyester film;
the first layer of ionomer resin film being in contact with the inner metal surface of the cylinder;
the layer of aluminum foil being between the two layers of ionomer resin films;
the layer of polyester film covering the second layer of ionomer film to isolate the latter from the gas generating propellant; and
metal end caps closing the ends of the cylinder.

4,414,903

AUTOMATIC GUIDANCE MECHANISM

Mark E. Fasse, and Herbert C. Giesmann, both of Omaha, Nebr., assignors to Pathfinder Systems, Inc., Lexington, Nebr.

Continuation of Ser. No. 39,224, May 14, 1979, abandoned, which is a division of Ser. No. 779,684, Mar. 21, 1977, Pat. No. 4,161,143. This application Apr. 26, 1982, Ser. No. 371,957
Int. Cl.³ B62D 1/26
U.S. Cl. 104—244.1 9 Claims



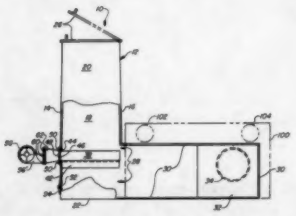
2. An improvement in furrow followers of a type adapted to connection to automatic steering mechanisms for causing a vehicle to selectively follow a furrow wherein the improvement comprises:
a displacement sensing means for sensing a probe means wherein said displacement sensing means is operably connected to the automatic steering mechanism;
a drag plate which is pivotally attached to said displacement sensing means about a horizontal pivot axis wherein said horizontal pivot axis lies within a plane substantially parallel to the surface transversed by said vehicle;
a first furrow probe means operably connected to said drag plate wherein said first furrow probe means is disposed in trail position behind said drag plate; and
a second furrow probe means operably connected to said drag plate wherein said second furrow probe means is disposed in spaced trail position behind said first probe means, and wherein said second furrow probe means is connected to said drag plate independently of said first probe means, whereby each probe means is capable of overriding an obstruction in said furrow independently of said other probe means.

4,414,904

WASTE-BURNING FURNACE

Glenn M. Foster, Rte. 4, Box 559, Yadkinville, N.C. 27055

Filed Dec. 2, 1981, Ser. No. 326,714
Int. Cl.³ F23K 3/00
U.S. Cl. 110—102 9 Claims



1. A furnace for efficiently burning sawdust and similar waste-type fuel, comprising:
an upstanding hopper-like member having a fuel inlet adjacent its upper end and a combustion gas passageway opening laterally from its lower end portion;
a generally horizontally extending and box-like hollow grate disposed within said hopper-like member at an elevation spaced closely beneath the uppermost extremity of said passageway, said grate having a hollow border section and a plurality of hollow coplanar spacially aligned medial sections, said medial sections communicating with said hollow border section, rod means, said rod means being coplanar with upper surface of said medial sections, said rod means being laterally centered between said medial sections and rigidly joined to said border section, said grate having a plurality of laterally spaced slot-like openings extending horizontally of and vertically through the medial portion thereof;
the interior of said hopper-like member being smooth surfaced and of gradually increasing cross-sectional area from said fuel inlet to said grate to facilitate gravity descent of said fuel within said member from said inlet to said grate;
a manifold chamber extending generally horizontally outwardly from said lower end portion of said hopper-like member and communicating therewith through said passageway of said member;
duct means communicating with said manifold chamber for conducting therefrom heated gaseous products of combustion introduced into said chamber from said passageway of said hopper-like member;
blower means disposed exteriorally of said hopper-like member and communicating with said grate for, when actuated, conducting air to the interior of said grate; said grate having first aperture means therein for discharging jets of

air substantially vertically upwardly from said grate, and having second aperture means for discharging angularly upwardly jets of air from said grate, and having third aperture means for discharging jets of air substantially vertically downwardly from said grate, and having fourth aperture means for discharging jets of air angularly downwardly from said grate.

4,414,905

METHOD AND EQUIPMENT FOR TREATMENT OF FUEL FOR FLUIDIZED BED COMBUSTION

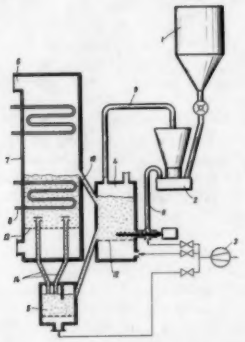
Jaroslav Beranek; Germak, Jan, both of Prague; Jaroslav Dobrozemsky, Uhliska, and Vratislav Fibinger, Vaclava Vacka, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 150,317, May 16, 1980, Pat. No. 4,325,311. This application Mar. 9, 1982, Ser. No. 356,472

Claims priority, application Czechoslovakia, May 17, 1979, 3424-79

Int. Cl.³ F23G *7/00*

U.S. Cl. 110—245 **1 Claim**



1. Apparatus for treatment of fuel which comprises a fuel bunker, a fuel crusher and a fluidized bed dryer, said fluidized bed dryer being provided with a first piping for introduction of fluidizable fuel from the crusher into the fluidized bed dryer; a second piping for introduction of hot particles from a fluidized bed combustor to said fluidized bed dryer; a fluidized bed seal and piping for transfer of fluidized particles from the fluidized bed dryer to the fluidized bed combustor; and means for transfer of nonfluidizing particles from the bottom of the fluidized bed dryer to said fuel crusher.

4,414,906

FUEL CARTRIDGE AND BURNER

Edward Hartouni, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Aug. 24, 1981, Ser. No. 295,204

Int. Cl.³ F23K *3/00*

U.S. Cl. 110—293 **2 Claims**

1. A solid fuel cartridge and burner comprising:

a vertically oriented burner casing for mounting in a furnace,

a hollow cylindrical support sleeve mountable concentrically within and spaced from the burner casing to form a combustion gas passage therebetween for transferring the gaseous combustion products of said burner to other furnace components,

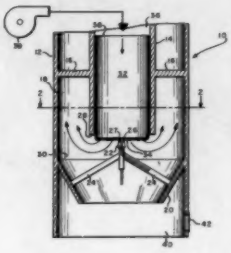
a self-supportable fuel element mountable in the support sleeve with a close but slideable fit,

the fuel element being formed of consolidated solid fuel particles and having a selected combustion surface,

a mandrel positionable in the center of the casing and spaced below the support sleeve upon which the lower end of the fuel element rests,

a combustion chamber surrounding the mandrel formed by the burner casing and in communication with the combustion gas passage,

pressure generating means for supplying air under pressure to the fuel element at its end opposite the mandrel for



combustion of the fuel particles at the selected combustion surface and in the combustion chamber,

the fuel element including intersticial spaces between the consolidated fuel particles for permitting the passage of air for combustion through the fuel element to the selected combustion surface, and

means contained within the mandrel for igniting the fuel particles at the combustion surface.

4,414,907

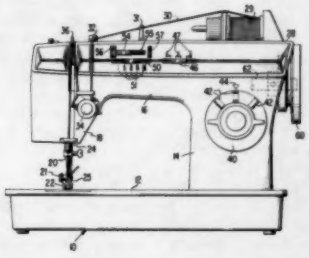
BUTTONHOLE WIDTH ADJUSTING MECHANISM

Edward J. Tullman, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 5, 1982, Ser. No. 365,754

Int. Cl.³ D05B *3/02, 3/06*

U.S. Cl. 112—158 B **5 Claims**



1. A sewing machine having a needle bar gate arranged for pivotal vibratory motion along an axis;

means for storing bight information;

means for sensing said stored bight information;

means for imparting pivotal vibratory motion to said needle bar gate in relation to said bight information sensed by said sensing means;

means between said imparting means and said sensing means for selectively attenuating the motion imparted to said imparting means by said sensing means; and,

control means interposed between said needle bar gate and said imparting means for selectively effecting specific proportions of said imparted pivotal vibratory motion.

4,414,908

SUTURING MACHINE FOR MEDICAL TREATMENT

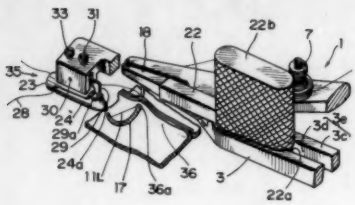
Yasukata Eguchi, Kunitachi; Susumu Hanyu, Hachioji; Reishi Nemoto, Kanagawa, and Masayoshi Takahashi, Sagamihara, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

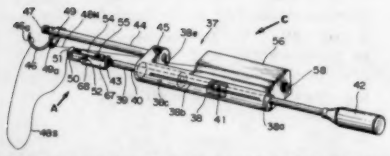
Filed Nov. 26, 1980, Ser. No. 210,764

Claims priority, application Japan, Dec. 4, 1979, 54-156358; May 12, 1980, 55-61713

Int. Cl.³ D05B *1/02*

U.S. Cl. 112—169 **5 Claims**





1. A suturing machine for use in medical treatment by producing continuous stitches on parts to be sutured, comprising a curved needle for holding a needle thread; means for holding said needle and operative for inserting said curved needle into the parts to be sutured to form a thread loop; a shuttle for holding a shuttle thread; means for holding said shuttle and operative for inserting the shuttle thread into said thread loop to thereby interlock said loop and to produce a lock stitch, said shuttle holding means being mounted on said needle holding means and being operative when said needle holding means is inoperative with said needle in the raised position, said needle holding means including a pair of grips each having an end portion, the end portions forming jaws operative for releasably holding said curved needle, one of said grips being formed with a guide groove, said shuttle holding means including an elongated support having a shuttle holder at one end thereof, displaceable lengthwise of said one grip and a guiding member at its other end; said guiding member being slidably positioned within said guiding groove for guiding said shuttle holder in its displacement lengthwise of said one grip towards and from the thread loop formed by said curved needle.

4. A suturing machine for use in medical treatment by producing continuous stitches on parts to be sutured, comprising a curved needle for holding a needle thread; means for holding said needle and operative for inserting said curved needle into the parts to be sutured to form a thread loop; a shuttle for holding a shuttle thread; means for holding said shuttle and operative for inserting the shuttle thread into said thread loop to thereby interlock said loop and to produce a lock stitch, said shuttle holding means being mounted on said needle holding means and being operative when said needle holding means is inoperative with said needle in the raised position, said needle holding means including an elongated frame formed with a grip, and a needle supporting bar connected to said frame and holding said curved needle, said frame beinf formed with a guiding bore, said shuttle holding means including a support rod and a shuttle holder connected thereto, said support rod being guided in said guiding bore of said elongated frame to be displaced lengthwise thereof for moving said shuttle holder towards and from the thread loop formed by said curved needle.

4,414,909

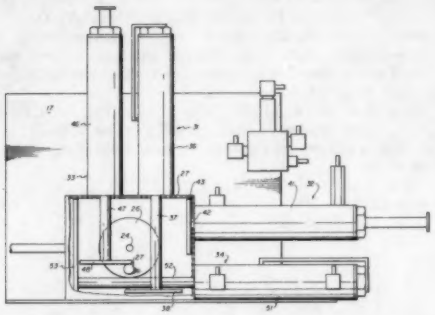
NEEDLE POSITIONER FOR SEWING MACHINE

Murel B. Bray, 3112 Rosa Ave., El Paso, Tex. 79905

Filed Mar. 17, 1981, Ser. No. 244,598

Int. Cl.³ D05B *69/22, 69/08*

U.S. Cl. 112—274 **8 Claims**



1. A positioner assembly for a sewing machine having a head provided with shaft means and drive means connected to said shaft means to move a sewing machine needle reciprocally into and out of a workpiece comprising, in combination, means for disconnecting said drive means from said shaft means, a frame, crank means rotatably supported on said frame, means for drivably connecting said crank means to said shaft means, a plurality of pneumatically actuated drive units on said frame each selectively engagable with said crank means to move said crank means into a plurality of predetermined rotary positions, conduit means including valve means on said frame for selectively communicating said drive units with an associated source of pneumatic pressure for selective actuation of said drive units to thereby position said needle in a selected one of a needle position up and a needle down position wherein said valve means include a manually actuated first valve for selectively connecting said drive units to said associated source of pneumatic pressure to move said needle into the up position and a manually actuated second valve for selectively connecting said drive units to said associated source of pneumatic pressure to move said needle into the down position wherein said drive units include four main cylinder/piston assemblies, each of said main cylinder/piston assemblies being disposed on said frame for selective driving engagement of said pistons with said crank means to rotate said crank means sequentially through increments of approximately 90°.

4,414,910

ASSEMBLY OF TURNABLE MEMBER AND MOUNTING THEREFOR

Julian Renton, London, England, assignor to RWO (Marine Equipment) Limited, Benfleet, England

Continuation of Ser. No. 215,016, Dec. 10, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 431,622

Claims priority, application United Kingdom, Dec. 19, 1979, 7943785

Int. Cl.³ B63B *21/04*

U.S. Cl. 114—218 **24 Claims**

1. An assembly comprising:

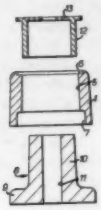
a turnable member having a through bore and intended to be mounted for turning about the longitudinal axis of the through bore;

a mounting member;

a pillar to the mounting member, the mounting member having a through bore coaxial with the pillar, the through

bore of the turnable member and the outer surface of the pillar being tapered; and

a deformable sleeve member of plastics material; the sleeve member being shaped to fit within the through bore in the



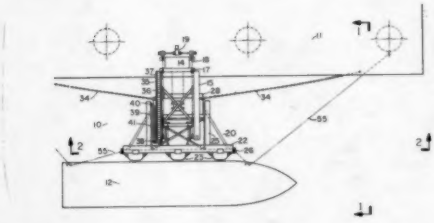
turnable member and the pillar being shaped to fit within the sleeve such that, by deformation of the sleeve, a press fit of the pillar in the sleeve is achieved sufficient to hold the assembly together during transport while still permitting rotation of the turnable member relative to the pillar.

4,414,911

BERTH FOR MOORING SUPPLY SHIP TO AN OFFSHORE PLATFORM AND FOR TRANSFERRING PERSONNEL BETWEEN THEM

Sidney I. Belinsky, 40 Waterside Plaza, Apt. 29M, New York, N.Y. 10010

Filed Jun. 19, 1981, Ser. No. 275,491
Int. Cl.³ B63B *59/02*
U.S. Cl. 114—219 **7 Claims**



1. A berth for mooring ship to an offshore platform and transferring the personnel between them comprising

a floating fendering system, having a breasting beam with positive buoyancy located along one of the sides of said offshore platform,

a derrick crane located on an upper deck edge of said offshore platform and having a boom, tower and luffing winch,

an intermediate massive platform,

a pair of inclined levers through which said floating fendering system is connected to said intermediate massive platform,

a berth suspension system having two pairs of suspension flexible lines, each pair of said suspension lines is connected through their lowest ends to said massive platform, forming a gravity balanced pendulum with two pivotal points, an outer pair of said lines is connected by its upper ends to said boom, of said derrick crane, the inner pair of said lines is connected to an upper deck of said offshore platform,

a winch, for lifting said floating fendering system, located on the upper part of said boom and having hoisting ropes connected to said inclined levers,

an elevator for transporting personnel from said intermediate platform to the upper deck of said offshore platform,

a system of ladders and gangways, providing a pass for personnel between the upper deck of the offshore platform and a moored supply ship,

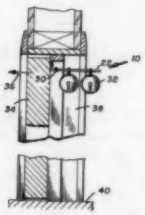
a system supporting mooring operation.

4,414,912

BURGLAR ALARM

Charles W. Algire, 4730 Dunkirk Ave., Baltimore, Md. 21229

Continuation of Ser. No. 187,577, Sep. 15, 1980, abandoned. This application May 21, 1982, Ser. No. 380,860
Int. Cl.³ G08B *17/02*
U.S. Cl. 116—5 **11 Claims**



1. An alarm system, comprising:

a base means;

a support means, said support means being of a rod-like configuration, said support means having one end of said rod-like configuration further formed into a loop-like eye configuration, said loop-like eye being used to facilitate affixing said support means to said base means, said support means being of a single configuration;

a fastening means, said fastening means being used to permanently affix said support means to said base means, said fastening means being passed through said loop-like eye configuration and permanently inserted into said base means, said fastening means permanently securing said support means to said base means during period of use and recurring reuse of said alarm system;

an alarm means, said alarm means being capable to causing bell-like sounds, said alarm means being slideably and removably placed upon said support means, said alarm means being operated to cause said bell-like sounds when said alarm means is causably stripped from said support means;

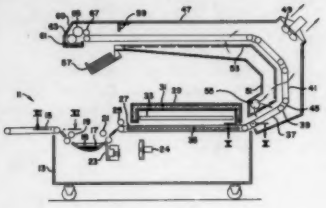
a wiper means;

and a holding means, said wiper means being of eye-like configuration and having a mounting means affixed thereto, said wiper means being located and affixed in position on said holding means, said holding means being adjacent to and separate from said base means, said wiper means being affixed to said holding means by said mounting means, said wiper means being so located and affixed to said holding means so that said rod-like support means, affixed to said base means, will slideably and removably enter and pass into and partially through said eye-like wiper means, said wiper means causably stripping said alarm means from said support means when said alarm means is activated by the movement of said support means, said alarm means consisting of at least one sleigh bell of substantially spherical shape to cause said bell-like sounds.

4,414,913
THERMO-ENGRAVING MACHINE FOR PRINTING IN RELIEF

Jean L. Sarda, 25 Rue Pradier, 75019 Paris, France

Filed Jul. 15, 1981, Ser. No. 283,515
Claims priority, application European Pat. Off., Jul. 18, 1980, 80401072-6
Int. Cl.³ B05C *11/02, 19/00*
U.S. Cl. 118—46 39 Claims

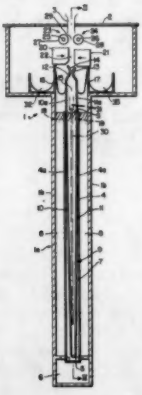


1. A thermo-engraving machine, comprising in combination:
deposition means for depositing a heat sensitive powder deposit on wet ink of freshly printed individual sheets;
heater means for heating the sheets to melt the powder deposit, the heater means having an entrance and an exit;
advancing means for continuously advancing the sheets from a printing machine through the heater means; and
cooling conveyor means for cooling the sheets exiting from the heater means and returning the sheets to a vicinity near the entrance of the heater means.

4,414,914
SOLDER LEVELING DEVICE HAVING MEANS FOR VERTICALLY GUIDING PRINTED CIRCUIT BOARDS

Hans P. Caratsch, Bremgarten, Switzerland, assignor to Sinter Limited, Bristol, England

Filed Sep. 9, 1981, Ser. No. 300,971
Claims priority, application Switzerland, Sep. 9, 1980, 6760/80
Int. Cl.³ H05K *3/24*
U.S. Cl. 118—63 14 Claims

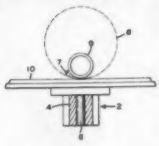


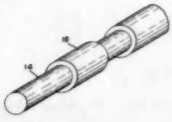
1. An apparatus for the application of solder to a printed circuit board, said apparatus comprising:
a solder bath container adapted to contain therein a solder bath, said container havng an open upper end, whereby a printed circuit board is movable vertically through said open upper end into and out of the solder bath; and
guide means for guiding the printed circuit board during movement thereof into and out of the solder bath by loose contact only with opposite sides of the printed circuit board and without contact with lateral edges thereof, said guide means comprising a plurality of generally vertically extending rod-shaped guide elements extending into the solder bath within said container and arranged in two parallel rows spaced from each other by a distance greater than the thickness of a printed circuit board to be soldered, each said row comprising plural said guide elements spaced from each other across the width of said container and adapted to confront and guide a respective side of the printed circuit board, at least one of said guide elements being mounted in such a manner so as not to impede contact of said solder both with said lateral edges of a printed circit board.

4,414,915
ROTARY SCREEN SQUEEGEE ROD

Harold N. Graybeal, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Mar. 22, 1982, Ser. No. 360,787
Int. Cl.³ B41L *13/18;* B05C *1/00*
U.S. Cl. 118—213 2 Claims



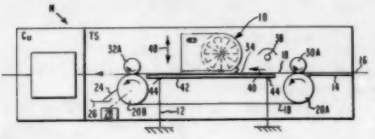


1. In a device for treating a web of material, said device being the type including at least one roller-shaped element formed of magnetically attractable material, said roller-shaped element being positioned on one side of the web of material to be treated and comprising means for applying a treating substance to said one side of said web of material, and a magnetic element positioned on the opposite side of said web of material, said magnetic element including a series of electromagnets arranged one after the other in a longitudinal direction across the width of the web of material, said magnetic element being means for attracting said roller-shaped element and thereby forcing said roller-shaped element against one side of said web of material; the improvement comprising:
said roller-shaped element being a hollow steel rod, steel slugs of different lengths fitting within said rod and being positioned in different positions along the length of the rod, the steel slugs being hollow and positioned at different points on a wooden rod the same length as the hollow rod, said wood rod with steel slugs being inserted in the hollow rod.

4,414,916
AUTOMATIC TONING APPARATUS HAVING A VERTICALLY RECIPROCATING HOPPER

Jose V. Martin, Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 20, 1981, Ser. No. 265,445
Int. Cl.³ B05C 11/02, 19/00
U.S. Cl. 118—612 22 Claims



1. Apparatus for applying a particulate toner to an image-defining tacky surface on a photo-element comprising:

means for transporting a photo-element along a predetermined transport path;

a hopper for receiving particulate toner therein, the hopper being spaced above the transport path and having a slot therein communicating with the transport path, the slot having a predetermined dimension measured in the direction of travel of the photo-element along the transport path;

a reciprocating device for vertically moving the hopper as a whole in a reciprocating fashion toward and away from the transport path to impart vibrational energy to the toner to fluidize the same to cause it to flow through the slot to form a toner pool from which pool toner is depositable on a photo-element transportable therebeneath, the reciprocating device imparting an oscillatory motion to the hopper at a frequency in the range from 0 to 50 Hertz (0<frequency≦50 Hertz), and at an amplitude (peak-to-peak) in the range from 0 to 0.150 inches (0<amplitude≦0.150 inches);

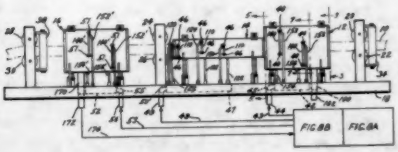
a toning pad disposed downstream of the pool in the direction of travel of the photo-element, the pad being attached to the hopper for reciprocating movement therewith; and

a flat toning support surface disposed vertically opposite the pad and beneath the transport path, the toning support surface serving to support the photo-element while the reciprocating oscillatory motion of the hopper is transmitted to the pad such that the pad pats into the photo-element toner that has been deposited from the pool onto the photo-element.

4,414,917
SYSTEM FOR SELECTIVELY TREATING CABLES AND THE LIKE

Joseph J. Bentley, Goleta; Thomas E. Brown, Los Angeles, and Jerome Unrine, Ventura, all of Calif., assignors to Industrial Cleaning and Coating, Inc., Ventura, Calif.

Filed Jan. 3, 1983, Ser. No. 455,409
Int. Cl.³ B05C 5/00
U.S. Cl. 118—695 14 Claims



1. In combination:

an elongated first cylinder adapted for receiving a cable, said cylinder having entrance and exit ends;

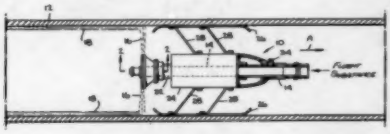
nozzle means supported by said cylinder, said nozzle means having spaced nozzle inputs along said cylinder beginning adjacent said exit end, each of the nozzle inputs being adapted to direct air tangentially of the cable, each of the nozzle inputs also being adapted to direct air towards said entrance end at a respective angle with respect to a diametral plane, the angles increasing so the angle of the nozzle inputs adjacent said exit end is less than the angle of nozzle inputs spaced along said cylinder;

and means to apply air under pressure to said nozzle means.

4,414,918
DISTRIBUTOR HEAD FOR A PIPE LINING MACHINE

Henry A. Nelson Holland, and James Bandura, both of Houston, Tex., assignors to Raymond International Builders, Inc., Houston, Tex.

Filed Feb. 11, 1982, Ser. No. 347,934
Int. Cl.³ B05C 7/02
U.S. Cl. 118—306 13 Claims

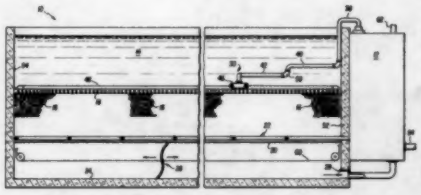


1. A distributor head for a pipe lining machine in which a fluent substance is thrown outwardly onto the inner wall of a pipe being lined, said distributor head comprising an outer rotating member having an outwardly flared inner surface, means for depositing said fluent substance onto the inner surface of said rotating member so that, as said member rotates, the fluent substance is caused, by centrifugal action, to flow along said inner surface toward its outer edge, said means for depositing said fluent substance comprising an inner conduit for receiving said substance, said inner conduit having elongated slots distributed thereabout and extending axially thereof through which said fluent substance may pass and a plurality of inner vanes mounted to revolve about said inner conduit over said slots to engage the fluent substance and throw it outwardly onto the inner surface of said rotating member, said inner vanes being individually and releasably fitted into a collar at the inner edge of said outer rotating member.

4,414,919
FLOWDOWN REARING POND

W. John Hess, 123 Union St., Walla Walla, Wash. 99362

Filed Oct. 27, 1981, Ser. No. 315,552
Int. Cl.³ A01K 63/00
U.S. Cl. 119—3 12 Claims



1. A fish rearing, water-recirculating module comprising;

(a) a housing having a filter media space therein;

(b) a fluid filter media located within said filter media space;

(c) means, located below said filter media space for collecting water that has passed through said filter media;

(d) means for returning said filtered water to a location above said filter media space, and;

(e) means for spraying said returned water to cleanse said filter media.

4,414,920

BLOCK FOR SUPPORTING THE POLES OF EQUESTRIAN FENCES

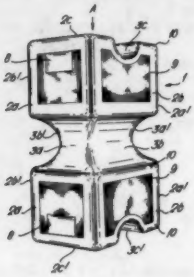
Peter K. Richards, Ballinaclash, Rathdrum, County Wicklow, and Harry J. Hamilton, Amalurra, Newtownmountkennedy, County Wicklow, both of Ireland

Filed Oct. 29, 1981, Ser. No. 316,517

Claims priority, application Ireland, Oct. 31, 1980, 2267/80; Dec. 4, 1980, 2537/80

Int. Cl.³ A63K *3/00*

U.S. Cl. 119—29 9 Claims



1. A device for use in supporting one end of an equestrian fence pole, or for the like purposes, the device comprising a block which is rectangular in cross section and thereby has three mutually perpendicular pairs of opposed faces, at least one of the faces of each said pairs having a groove extending across the face, the groove being for receiving and supporting one end of the pole when the block is placed on the ground or on top of another such block, the three pairs of opposed faces being so dimensioned that the block can be used to support the pole at any one of three different heights selected by orienting the block with a face of a selected one of the pairs of faces facing upward.

4,414,921

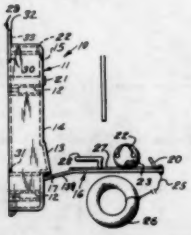
TRAINING AID BELL FOR PETS

Joseph A. Cozzi, 212 Washington Ave., Little Ferry, N.J. 07643

Filed Nov. 25, 1981, Ser. No. 325,003

Int. Cl.³ A01K *15/00*

U.S. Cl. 119—29 17 Claims



1. A training aid for use in connection with training a pet and subsequently enabling the pet to communicate a particular desired activity to a person, the training aid comprising:

a stationary housing;

a sounding device on the housing;

an actuator mounted on the housing for movement relative to the housing and coupled to the sounding device for sounding of the sounding device in response to movement of the actuator relative to the housing by either one of the pet and the person; and

a display member located on the housing in stationary relationship therewith and including a display area placed in view of the person for identifying and displaying the particular activity signified by the sounding of the sounding device.

4,414,922

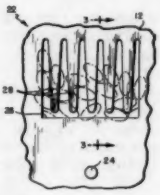
BIRD FEEDER

Donald B. Hyde, Jr., Stow, Mass., assignor to Hyde's Incorporated, Waltham, Mass.

Filed May 10, 1982, Ser. No. 376,526

Int. Cl.³ A01K *39/01*

U.S. Cl. 119—51 R 8 Claims



1. A bird feeder having a seed storage compartment at least partialy defined by a side wall, and an improved feeding port through which birds may extract seeds from said compartment, said port comprising an opening in said side wall, resilient finger means coextensive with said side wall and extending across said opening to partially occlude the same, said finger means being arranged to prevent a free flowing escape of seeds from said compartment through said opening and being flexible to accommodate forcible extraction of seeds from said compartment through said opening.

4,414,923

HEAT RECOVERY BOILER FOR HIGH PRESSURE GAS

Denis G. Csathy, and Robert J. Krowech, both of Minneapolis, Minn., assignors to Deltak Corporation, Minneapolis, Minn.

Filed Mar. 1, 1982, Ser. No. 353,129

Int. Cl.³ F22D *1/00*

U.S. Cl. 122—7 R 4 Claims

1. A boiler for generating steam by the recovery of heat from a hot gas stream comprising, in combination

(1) a closed vertical pressure vessel;

(2) a baffle extending across the pressure vessel to divide its interior into an upper compartment and a lower compartment, the baffle having a central opening therein;

(3) an inlet for a hot gas stream communicating with the upper compartment and an outlet for the gas stream leading from the lower compartment;

(4) an upper header arranged in the upper compartment;

(5) a bundle of vertical water tubes supported from the upper header and extending through the opening in the baffle to have lower ends positioned in the lower compartment of the pressure vessel;

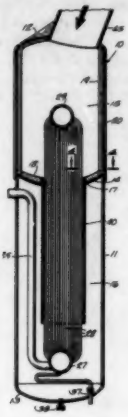
(6) a lower header supported from the lower ends of the water tubes;

(7) means for supplying water to the lower header and into the water tubes;

(8) shroud means surrounding the perimeter of the bundle of water tubes in the lower compartment extending from the baffle towards the lower ends of the water tubes and adapted to direct the flow of hot gas downwardly through the lower compartment and longitudinally along the water tubes; and

wherein hot gas entering the upper compartment of the boiler is directed into the lower compartment by the baffle

and directed downwardly parallel with the water tubes by the shroud means and steam generated by heat transfer



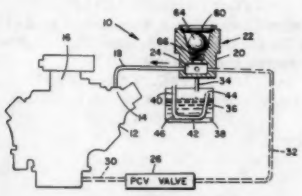
from the hot gas to water flowing upwardly through the water tubes is withdrawn from the upper header.

4,414,924

AIR JET UNIT

Hugh H. Harren, 1051 Site Dr. #81, Brea, Calif. 92621

Filed Jun. 22, 1981, Ser. No. 276,229
Int. Cl.³ F02M *25/02*
U.S. Cl. 123—25 E **9 Claims**



1. For a supplemental air and water injection system for internal combustion engines:

an air-water mixing chamber having water and air inlets and a water and air mixture outlet;

water conducting means for conducting water to said water inlet of the mixing chamber; and

a supplemental air flow valve in the form of a spring biased, normally open valve in which flow volume diminishes gradually as the valve is closed in response to increasing downstream negative pressure;

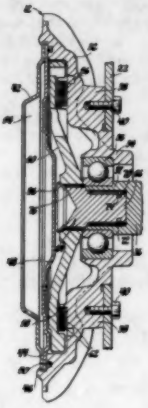
the air inlet, the water inlet, and the water and air mixture outlet of said mixing chamber being arranged at angles to one another such that water appearing at said water inlet is aspirated from said water inlet at low negative outlet pressure by air flow from said air inlet and is sucked from said water inlet by negative pressure at said outlet when the negative pressure at said outlet is high.

4,414,925

ENGINE COOLING FAN WITH SHEARABLE DRIVE TO ELIMINATE FAN OVERSPEED

Robert C. Mellin, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1982, Ser. No. 370,417
Int. Cl.³ F01P *5/14*
U.S. Cl. 123—41.12 **4 Claims**



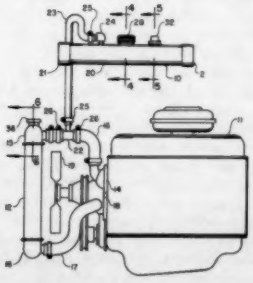
1. A rotatable fan and clutch assembly for cooling an internal combustion engine having a rotatable output for powering said fan, a clutch having rotatable clutch input means and rotatable output means driven by said clutch input means, a bladed fan operatively connected to said clutch output means, and frangible metallic drive plug means drivingly connecting said output of said engine to said clutch input means to break on attainment of a predetermined fan speed to terminate the rotational input into said clutch input means and thereby the drive of said fan for limiting the centrifugal forces developed by said fan while effecting the cooling of said engine.

4,414,926

ENGINE PRESSURE-VACUUM COOLING SYSTEM WITH A HORIZONTAL COOLANT STORAGE TANK

Robert C. Webber, 908 Holoma Dr., Indian River Shores, Fla. 32960

Filed Sep. 23, 1981, Ser. No. 304,832
Int. Cl.³ F01P *11/18*
U.S. Cl. 123—41.15 **3 Claims**



1. A pressure-vacuum cooling system for an internal combustion engine equipped with a radiator, wherein the cooling system may have on occasion a pressure less than atmospheric

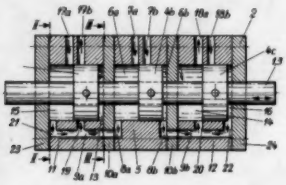
pressure, said invention comprising a connector for liquid interposed between the engine and the radiator, through which connector liquid coolant flows when the engine is operating, conduit means attached to said connector and to an elongate storage tank for coolant, the long axis of which tank is horizontally disposed, said conduit means forming a path for liquid coolant to flow on occasion between said radiator and engine on the one hand, and said storage tank on the other hand, a removable cap which, when removed, enables additional liquid, when needed, to be added to said cooling system, said cap having therein a one-way valve set to open in the pressure range of between 10 and 20 pounds per square inch when the engine is operating and the coolant has been heated thereby, said cap, when in place, effectively preventing the admission of any atmospheric air to the cooling system after the engine has thereafter ceased operation and the liquid coolant has cooled, and means for warning when the internal pressure of the system has reached a certain established point less than atmospheric pressure.

4,414,927

TWO STROKE OSCILLATING PISTON ENGINE

Istvan Simon, Otterngutstrasse 37, CH-8200 Schaffhausen, Switzerland

Filed Apr. 16, 1982, Ser. No. 368,985
Int. Cl.³ F02B *33/06, 1/08, 75/28*
U.S. Cl. 123—62 **4 Claims**



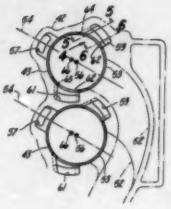
1. A two stroke oscillating piston engine with at least one reciprocating piston barrel and a corresponding number of hollow cylinders designed for two stroke operation and provided with fresh gas intake ports, fresh gas communication ducts and exhaust gas outlet ports, with this hollow cylinder composed of parallel sections bolted together and with the piston barrel actively connected with a crank gear so that the radial component forces on the piston barrel are kept as low as possible, characterized in that the piston barrel has a cylindrical shaft on which are fitted three cylinder-shaped rings acting as pistons, that the hollow cylinder surrounding the piston barrel has in its longitudinal center a cylinder section that is symmetrical with regard to this center and whose axial bore is divided by the middle ring of the piston barrel into two fresh gas feed chambers, with this cylinder section displaying, symmetrically to its longitudinal center, two fresh gas intake ports arranged side by side, and with the feed chambers connected at their outer ends each by one radial groove with the corresponding fresh gas communication duct, that on both front faces of the middle cylinder section is provided the same partition with the passing section of the pertaining fresh gas communication duct, that then and on these two partitions are assembled two reciprocally symmetrical working cylinder sections whose axial bores are divided by the two outer rings of the piston barrel into one inner combustion chamber and one outer fresh air feed chamber, that in the longitudinal center, at least, of these working cylinder sections are arranged two radial ports side by side, with the inner ports designed as exhaust gas outlet ports and the outer ports as fresh air intake ports, and that, diametrically opposed to the exhaust gas outlet ports, one radial communication port each leads to the pertaining fresh gas communication duct and at the outer ends of the fresh gas feed chambers, one radial fresh air groove each leads to the corresponding fresh gas communication duct.

4,414,928

PORT SCAVENGING TYPE TWO-CYCLE INTERNAL COMBUSTION ENGINE

Hiroyasu Nakada, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Itawa and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Jan. 4, 1982, Ser. No. 336,718
Claims priority, application Japan, Jan. 22, 1981, 56-8880
Int. Cl.³ F02B *33/04*
U.S. Cl. 123—73 PP **13 Claims**



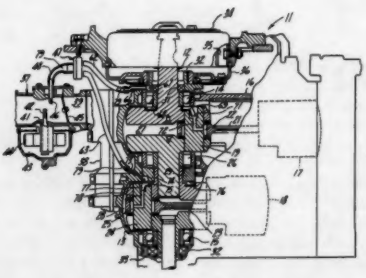
1. In a porting system for a two-cycle engine having a cylinder, exhaust port means opening through a wall of said cylinder and being intersected by a plane passing through the axis of said cylinder, and a plurality of scavenging passages having scavenging ports in said cylinder on opposite sides of said plane, the improvement comprising the centers of said scavenging ports lying in a plane perpendicular to the first mentioned plane and offset from said cylinder axis on the side opposite said exhaust port means, said scavenging passages having an arcuate shape in cross-sections taken perpendicular to the cylinder axis and defined by inner and outer surfaces spaced substantially equally from each other, the centers of said arcuate configuration being offset from the cylinder axis on the side opposite the exhaust port means so that the side of said scavenging passages closer to the exhaust port means lies closer to the cylinder.

4,414,929

LUBRICATION SYSTEM FOR TWO-CYCLE INTERNAL COMBUSTION ENGINES

Yoshihiro Sakurai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Jun. 21, 1982, Ser. No. 390,376
Claims priority, application Japan, Jul. 1, 1981, 56-103720
Int. Cl.³ F02B *33/04*
U.S. Cl. 123—73 R **8 Claims**



1. In a lubricating system for a two-cycle engine of the type in which fuel and lubricant are mixed and delivered to the engine from a charge forming device including an induction passage through which a fuel lubricant mixture is delivered

through an induction passage outlet to a chamber of the engine, the improvement comprising lubricant passage means communicating with at least a portion of said engine to be lubricated and means for delivering a fuel lubricant mixture to said lubricating passage means independently of said induction passage outlet.

4,414,930

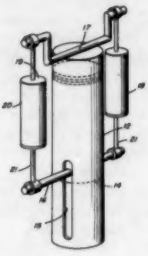
KINETIC ENGINE CONTROL

Douglas W. Hume, Crane Neck St., W. Newbury, Mass. 01985

Filed Oct. 2, 1981, Ser. No. 307,721

Int. Cl.³ F02B *75/04*

U.S. Cl. 123—78 E **4 Claims**



1. Apparatus for transferring power in an internal combustion engine having at least one cylinder, each said cylinder having a head and a piston reciprocable on an axis on one side of said head in said cylinder toward and away from said head, a crankshaft mounted adjacent and external to said head located on a side of said head opposite that of said one side, said cylinder having diametrically oppositely disposed longitudinal slots formed in the walls thereof, a cross-shaft fixed to said piston and extending outwardly through said slots and links of variable length connecting said cross-shaft to said crankshaft, each said link of variable length being extensible to a relatively great extent during the intake and power strokes of said engine and compressible to a relatively short extent during the compression stroke of said engine.

4,414,931

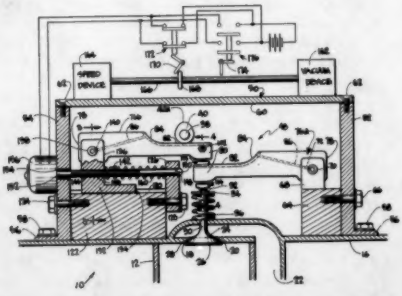
VARIABLE VALVE OPERATING MECHANISM FOR INTERNAL COMBUSTION ENGINES

Corliss O. Burandt, Plymouth, Minn., assignor to Investment Rarities, Incorporated, Minneapolis, Minn.

Filed Oct. 13, 1981, Ser. No. 310,655

Int. Cl.³ F01L *1/18*

U.S. Cl. 123—90.16 **25 Claims**



13. A mechanism for operating a valve of an internal combustion engine having a camshaft, a cam on said shaft, and a reciprocable valve member for opening and closing a valve port in communication with a combustion chamber of the engine, the mechanism comprising a first rocker arm, means mounting a portion near one end of said first rocker arm for pivotal movement about a first axis so that a certain portion nearer the other end of said rocker arm is engageable with said valve member, a second rocker arm, means mounting a portion near one end of said second rocker arm for pivotal movement about a second axis, means relatively moving said rocker arms in a direction toward and away from each other to vary the spacing between said axes so that the other end of said second rocker arm is engageable with various longitudinal portions of said first rocker arm between its said other end and its said one end, said cam being engageable with various longitudinal portions of said second rocker arm between its said other end and its said one end, the particular longitudinal portion being engaged by said cam depending on the spacing between said axes as determined by said moving means.

4,414,932

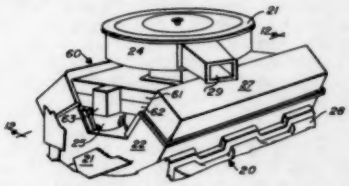
METHOD AND APPARATUS FOR HEAT STORAGE IN INTERNAL COMBUSTION ENGINES

John E. Lindberg, Point Richmond, Calif., assignor to Owen, Wickersham & Erickson, San Francisco, Calif.

Continuation-in-part of Ser. No. 190,932, Sep. 25, 1980, Pat. No. 4,393,817, and a continuation-in-part of Ser. No. 190,933, Sep. 25, 1980, abandoned, said Ser. No. 190,932, is a division of Ser. No. 657,747, Feb. 13, 1976, abandoned, said Ser. No. 190,933, is a continuation of Ser. No. 657,747, Feb. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 613,867, Sep. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 356,589, May 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 227,440, Feb. 18, 1972, abandoned. This application Oct. 28, 1981, Ser. No. 315,943

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—142.5 R **40 Claims**



4. Apparatus for improving combustion and ignition upon cold start of an internal-combustion engine, comprising:

change-of-state heat storage means disposed in heat-exchange relationship with the engine for absorbing engine heat from engine operation and hot soak following engine operation, and for maintaining increased engine temperature by gradually releasing stored heat back to the engine when the engine is at rest.

4,414,933

COMPRESSION RELEASE MECHANISM USING A BIMETALLIC DISC

Gary P. Pribnow, Shorewood, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jun. 15, 1981, Ser. No. 273,474

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—182 **5 Claims**

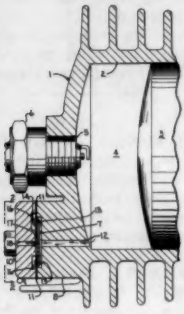
1. An automatic compression relief valve means for facilitating starting of an internal combustion engine of the type having a combustion chamber associated with a cylinder within a cylinder head and a piston having a compression stroke within said cylinder, comprising:

a housing member having a circular recess formed in its outer surface, said housing member including a centrally

located inlet vent hole communicating between said recess and said combustion chamber;

a cover member having a cavity formed in its outer surface, said cover member including a centrally located outlet hole communicating between said cavity and the outer atmosphere, said cover member removably secured to said housing member for enclosing said recess so that said cavity and recess provide a disc-receiving chamber;

said housing member further including a plurality of lands located at the bottom of said recess, said lands define a plurality of equiangularly spaced apart channels that extend radially from said inlet hole to a point beyond the



circumference of said recess for providing fluid communication between said inlet hole and said cavity, said inlet hole, channels, cavity and outlet hole defining a compression release pasageway,

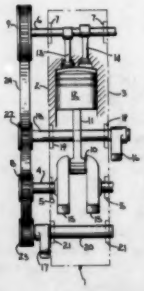
a thin, flexible disc member disposed in said chamber, said disc member normally relaxed in an open position supported by said lands so that compression in said combustion chamber is releived through said passageway during engine starting and automatically flexible to a closed position overlying said outlet hole in response to an increase in the temperature in said combustion chamber to block off said passageway during engine running.

4,414,934

RECIPROCATING PISTON-TYPE INTERNAL COMBUSTION ENGINE WITH IMPROVED BALANCING SYSTEM

Norbert M. Vogl, Milwaukee; Ronald R. Gaulke, Waukesha, and Joseph R. Harkness, Germantown, all of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 30, 1981, Ser. No. 248,908
Int. Cl.³ F02B *75/06*
U.S. Cl. 123—192 B **5 Claims**



1. An engine of the reciprocating piston type in which a crankshaft that is journaled in opposite end walls of an engine block has crankpin means by which it is linked with the piston means of the engine and conventional counterweight means fixed to the crankshaft diametrically opposite its crankpin means, said engine being characterized by:

A. first and second auxiliary shafts extending through the engine block and rotatably journaled in the opposite end walls thereof, each of said auxiliary shafts includes an end portion extending exteriorly of the engine block from one of said end walls, said auxiliary shafts define rotational axes that are fixed with respect to and parallel with the crankshaft axis on diametrically opposite sides thereof in a common plane with the crankshaft axis at equal distances therefrom which is greater than the radius of the circumferential path of the conventional counterweight means;

B. first and second auxiliary counterweights in addition to said conventional counterweight means mounted on respective end portions of said auxiliary shafts exteriorly of the engine block adjacent said one end wall; and

C. means for imparting rotation to said auxiliary counterweights in the direction opposite to that of the crankshaft but at the same speed, comprising:

(1) a toothed pulley coaxially fixed with respect to the auxiliary counterweight on each of said auxiliary shafts exteriorly of said engine block,

(2) a toothed pulley coaxially fixed with respect to the crankshaft exteriorly of said engine block, said toothed pulleys being of the same diameter, and

(3) an endless flexible motion transmitting element having opposite faces, each of which is drivingly engageable with the circumference of a toothed pulley, said flexible motion transmitting element being trained over all of said toothed pulleys with one face thereof engaging the toothed circumference of the pulley that is fixed with respect to the crankshaft and the opposite face thereof engaging the toothed circumference of the other of said pulleys, so that when the engine is running, said auxiliary counterweights rotate at crankshaft speed but in the opposite direction from that of the crankshaft, and said endless flexible motion transmitting element holding said auxiliary counterweights in such angular relationship to the conventional counterweight means that the inertial forces produced by rotation of the conventional counterweight means and of said auxiliary counterweights combine to substantially balance the inertial forces resulting from reciprocation of the piston means when the latter approaches either terminus of its stroke, whereas at substantially the point the piston means passes in either direction through the midpoint in its stroke, the inertial forces resulting from rotation of said auxiliary counterweights oppose the inertial forces resulting from rotation of said conventional counterweight means, and the summation of the moments produced by the conventional counterweight means and the additional counterweight means is zero and the summation of the centrifugal forces of all counterweights acts essentially along the path of the center of gravity of the piston means.

4,414,935

CYLINDER DEACTIVATION DEVICE WITH SLOTTED SLEEVE MECHANISM

Nikolaus A. Curtis, 3182 Iron Dr., and Carroll M. Renshaw, 2160 S. 27th Ave., both of Yuma, Ariz. 85364

Filed Feb. 9, 1981, Ser. No. 232,878
Int. Cl.³ F02D *13/06*
U.S. Cl. 123—198 F **14 Claims**

1. A cylinder deactivation device for installation on an internal combustion engine, said cylinder deactivation device comprising in combination:

a. rocker arm means for effecting opening a valve of said engine, said rocker arm means having a first end portion,

a second end portion, and a mid portion disposed between said first end portion and said second end portion;

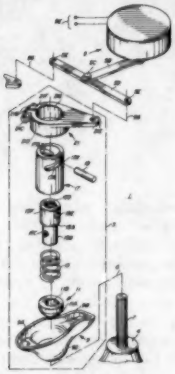
b. support means connected in fixed relationship with a head of said engine for supporting said cylinder deactivation device;

c. stand means for engaging said support means in an adjustable fixed relation thereto;

d. movable fulcrum means for selectively either,

i. assuming a first fixed relationship to said stand means to engage said mid portion and cause said rocker arm means to pivot about said mid-portion during operation of said engine, thereby causing a valve of said engine to open and close during operation of said engine, or

ii. yielding to movement of said mid portion to cause said rocker arm means to pivot about said second end portion during engine operation, said first end portion moving in response to a cam during engine operation, said second end portion engaging said valve, said valve



remaining closed during said pivoting about said second end portion, said movable fulcrum means including a movable sleeve disposed about said stand means;

e. selective engagement means disposed within said movable sleeve for selectively either

i. engaging both said movable sleeve and said stand means to cause said movable sleeve to assume said first fixed relationship to said fixed means, or

ii. releasing said movable sleeve from said first fixed relationship to allow said movable sleeve to yield to said movement of said mid portion; and

f. compression means for continuously exerting substantial opposed forces on said stand means and and said movable fulcrum means to urge said movable fulcrum means against said mid portion,

wherein said movable fulcrum means includes a slot and said stand means includes a hole, a pin extending into both said hole and said slot to keep said slot aligned with said hole.

4,414,936

CHECK VALVE CYLINDER DEACTIVATION

Craig W. Huff, 12307 Swinbrook, Houston, Tex. 77039

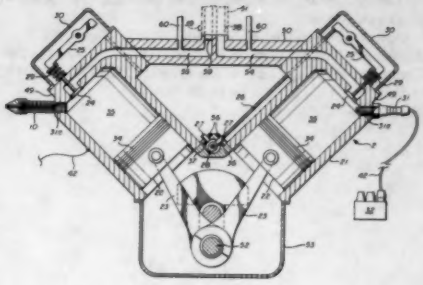
Filed Feb. 4, 1982, Ser. No. 345,779

Int. Cl.³ F02D *13/06*

U.S. Cl. 123—198 F **5 Claims**

1. In a multi-cylinder internal combustion engine, in which each cylinder has a piston, a spark plug, valves and valve actuating means, the improvement comprising:

a check valve replacing the spark plug in alternate cylinders in the firing order of the engine, each check valve having engaging threads on one end to match the existing threads in the cylinder wall after removal of the spark plug;



and the valve actuating means in the said alternate cylinders being disconnected.

4,414,937

AUTOMATIC ENGINE STOP AND START APPARATUS

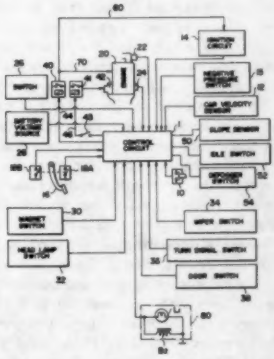
Masahiro Ueda, and Masahiko Noba, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 23, 1982, Ser. No. 360,975

Claims priority, application Japan, Aug. 25, 1981, 56-133079

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—198 D **24 Claims**



1. An automatic engine stop and start apparatus comprising:

detection means for detecting operational conditions of a car;

means for setting and resetting an automatic engine stop and start function;

means for detecting necessity for braking the car;

alarm means responsive to a control signal for issuing an alarm;

a control circuit responsive to the output signals from said detection means and said setting and resetting means for producing a control signal to automatically stop or start an engine under a predetermined condition; and

said control circuit producing said control signal to cause said alarm means to issue the alarm when the car starts to move and a car velocity exceeds a predetermined speed and a booster pressure of a brake falls below a predetermined level while the engine has been automatically stopped after the automatic engine stop or start function was set and the car is to be braked.

4,414,938

ROTARY INTERNAL COMBUSTION ENGINE

Soei Umeda, 10-14, 3-chome, Mitsuyaminami, Yodogawa-ku, Osaka-shi, Japan

Continuation-in-part of Ser. No. 37,333, May 9, 1979, abandoned. This application Feb. 19, 1981, Ser. No. 236,289
Claims priority, application Japan, Aug. 25, 1978, 53-104302
Int. Cl.³ F02B 53/00
U.S. Cl. 123—229 3 Claims

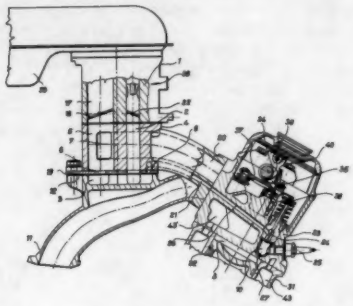
1. A rotary type internal combustion engine comprising:
a cylindrical rotor having a diametrical vane groove parallel with the longitudinal axis of said rotor;
a vane movably mounted in said vane groove and constituted by two vane parts opposed to each other at the center of the vane in the radial direction thereof;
a housing having an internal chamber in which said rotor is rotatably mounted, said chamber having a lower inner wall part with a cross-sectional shape of part of a circle and with which said rotor is coaxially rotatable in close contact therewith, and an upper inner wall part with a cross-sectional shape of part of an approximately elliptical shape and the center of which is offset from the center of the circular cross-sectional shape in a direction away from said lower inner wall part, said approximately elliptical shape having a constant diameter through the center of said circular cross-sectional shape, said vane having a diametrical dimension equal to said constant diameter and said upper inner wall part being at least the part of the entire inner wall which is on the side of the center of the circular cross-sectional shape in the direction of offset of the center of the elliptical shape, the radially outer ends of said vane parts engaging the inner wall of said upper inner wall part in substantially gas tight relation during rotation of said rotor;
said housing further having vane guide chambers at opposite ends of said internal chamber and having said approximately elliptical cross-sectional shape coaxial with the upper inner wall part of said housing; and said vane having vane guide portions on the opposite axial ends thereof engaging the inner walls of said vane guide chambers during rotation of said rotor;
an annular wall extending into the elliptical portion substantially midway of the axial length of said chamber, and said vane having a recess therein into which said central annular wall projects and engaging said vane for guiding said vane; and
means for intermittently permitting aspiration of a combustible gas into the part of the internal chamber within said upper inner wall part, for igniting and burning the gas for driving said vane and rotor, and exhausting the burned gas.

4,414,939

METHOD OF AND APPARATUS FOR PREPARING A FUEL MIXTURE FOR AN INTERNAL COMBUSTION ENGINE

Stanislav Jahoda, Praha, Czechoslovakia, assignor to Ustav Pro Vyzkum Motorovych Vozidel, Prague, Switzerland

Filed Dec. 28, 1979, Ser. No. 108,332
Claims priority, application Czechoslovakia, Dec. 29, 1978, 9148-78
Int. Cl.³ F02M 11/00
U.S. Cl. 123—274 3 Claims



1. In an internal combustion engine having a major combustion chamber, and a minor combustion chamber, the improvement which comprises means for dividing a prepared rich fuel mixture into two flows, means for supplying one of said flows into the minor combustion chamber, means for mixing the other flow with air to form a depleted, lean fuel mixture, and means for supplying the thus depleted fuel mixture into the major combustion chamber, the means for dividing a prepared rich fuel mixture into two flows being a distribution chamber, the means supplying one of said flows into the minor combustion chamber being a minor suction tube, the means for mixing the other flow with air to form a depleted, lean mixture being a mixing chamber, the means to supply the depleted lean fuel mixture into the major combustion chamber being a major suction tube, and comprising means providing an air supply passage connected to the mixing chamber, the mixing chamber being connected to the major combustion chamber by the major suction tube, between the mixer and the mixing chamber there being provided the distribution chamber communicating with the mixer, the mixing chamber and the minor combustion chamber, the mixer communicating with the distribution chamber via a duct provided in the suction piping for the engine, there also being provided in said suction piping the mixing chamber which latter communicates, via at least one first aperture, with at least one major suction tube, as well as a recess communicating with a distribution chamber and, via at least one second aperture, with at least one minor suction tube.

4,414,940

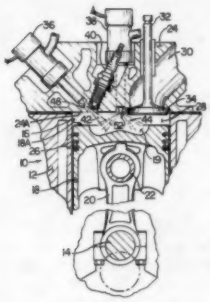
CONDITIONED COMPRESSION IGNITION SYSTEM FOR STRATIFIED CHARGE ENGINES

Robert W. Loyd, Rte. 4, Fond du Lac, Wis. 54935

Filed Apr. 13, 1981, Ser. No. 253,581
Int. Cl.³ F02B 3/00
U.S. Cl. 123—299 22 Claims

1. A combustion process for use in a reciprocating internal combustion engine having at least one cylinder and a piston reciprocally movable in said cylinder to define a variable volume combustion chamber, said process comprising the steps of supplying air to the combustion chamber, said air being admitted to the combustion chamber through an intake passage which is substantially unthrottled thereby providing a minimum restriction on the intake of incoming air, said air entering

the combustion chamber in a flow path independent of any special air flow pattern or swirl pattern requirement to accommodate ignition of the fuel, compressing the air in the chamber, introducing a pilot fuel charge from a first fuel nozzle into the combustion chamber after the air therein has been partially compressed, igniting the pilot fuel charge substantially immediately upon its issuing into the combustion chamber to cause a pilot fuel burn, the energy derived from said pilot fuel burn serving to increase the temperature and pressure of the gas in the combustion chamber, and subsequent to said pilot fuel burn introducing a main fuel charge from a second fuel nozzle into said combustion chamber whereby auto ignition of said main fuel occurs, said main fuel injected into the combustion chamber by said second nozzle being in a spray pattern shaped to fit the combustion chamber for best burning efficiency rather than being in a spray pattern which provides contact with a flame front established by the ignition of the pilot fuel, the engine power output being controlled by varying the quantity of main fuel charge injected by said second nozzle, whereby the air-fuel ratio will vary with load changes but will always be substantially in the lean mixture range, said internal combustion engine with which said process is used having a compression ratio which is in a range characteristic of the compression ratio range of a carbureted engine, whereby the internal combustion engine with which said process is used may have a structural strength design characteristic of that of a carbureted engine rather than the heavy structure of a compression ignition engine.



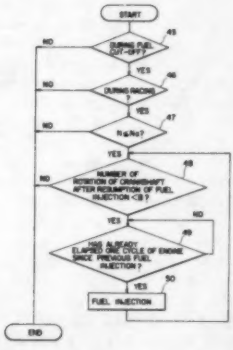
15. A stratified charge reciprocating internal combustion engine comprising a crankcase having at least one cylinder and supporting a cylinder head which houses an air inlet valve and an exhaust valve for said cylinder, air being admitted to said combustion chamber through an air inlet passage which is substantially unthrottled, thereby providing a minimum of restriction on the charge of incoming air, said air inlet passage being openable and closable by said air inlet valve, said air entering the combustion chamber in a flow path independent of any special air flow pattern or swirl pattern requirement to accommodate ignition of the fuel, a piston reciprocally movable in said cylinder to define a variable volume combustion chamber, a pilot fuel injection nozzle mounted in said cylinder head and positioned to discharge a pilot fuel charge into said combustion chamber, ignition means mounted in said cylinder head and positioned adjacent said pilot fuel injection nozzle, a main fuel injection nozzle mounted in said cylinder head and positioned to discharge a main fuel charge into said combustion chamber, means for causing said pilot fuel injection nozzle to discharge a pilot fuel charge into said combustion chamber and for causing said ignition means to ignite said pilot fuel charge as it is discharged into said combustion chamber to thereby cause a pilot fuel burn, the energy derived from said pilot fuel burn serving to increase the temperature and pressure of the gas in the combustion chamber, and means for causing said main fuel injection nozzle to discharge a main fuel charge into said combustion chamber on the compression stroke of said piston subsequent to said pilot fuel burn whereby auto ignition of said main fuel occurs, said main fuel injected into the combustion chamber by said main fuel nozzle being in a spray pattern shaped to fit the combustion chamber for best burning efficiency rather than being in a spray pattern which provides contact with a flame front established by the ignition of the pilot fuel, means for controlling the engine power output by varying the quantity of main fuel charge injected by said main fuel injection nozzle, whereby the air-fuel ratio will vary with load changes but will always be substantially in the lean mixture range, said internal combustion engine having a compression ratio which is in a range characteristic of the compression rato of a carbureted engine, whereby the internal combustion engine has a structural strength design characteristic of that of a carbureted engine rather than the heavy structure of a compression ignition engine.

4,414,941

METHOD AND APPARATUS FOR FUEL INJECTION IN ELECTRONIC FUEL INJECTION CONTROLLED ENGINES

Tatsuaki Nakanishi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 30, 1981, Ser. No. 326,075
Claims priority, application Japan, Aug. 7, 1981, 56-123099
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—326 **10 Claims**



1. A fuel injection method for an electronic fuel injection controlled engine for controlling an amount of fuel injected from a fuel injection valve in an intake system by operating the fuel injection valve according to electric signals, said method comprising:

detecting a fuel cut-off period;

detecting the rate of reduction of the rotational speed of the engine during the fuel cut-off period;

descrimination between racing and idling conditions of the engine;

resuming the injection of fuel;

increasing, for a predetermined period of time, the fuel injection amount after the resumption of fuel injection after a fuel cut-off period caused by the racing condition more than for a fuel cut-off period caused by an idling condition even at the same rotational speed of the engine after the resumption of the fuel injection; and

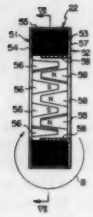
providing a period of at least one cycle of the engine between the plurality of injection times of the increased fuel injection amounts after the resumption of fuel injection.

4,414,942

IDLING SPEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Hiroshi Itoh, Nagoya, and Haruo Watanabe, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 9, 1981, Ser. No. 271,931
Claims priority, application Japan, Sep. 16, 1980, 55-130226[U]
Int. Cl.³ F02D 1/00
U.S. Cl. 123—339 3 Claims



1. An idling speed control device of an internal combustion engine having an intake passage and a throttle valve arranged in the intake passage, said device comprising:

a surge tank having an outer wall and arranged in the intake passage located downstream of the throttle valve;

a bypass passage interconnecting the intake passage located upstream of the throttle valve to said surge tank;

valve means arranged in said bypass passage and having a valve housing which has a flange directly fixed onto the outer wall of said surge tank, said valve means having a control valve which controls a flow area of said bypass passage;

a step motor connected to said control valve for controlling the amount of air flowing within said bypass passage in accordance with a change in the operating condition of the engine at the time of idling;

said step motor comprising a motor housing, a stator stationairly arranged in said motor housing, a rotor rotatably arranged in said motor housing and, a valve shaft axially movable in said motor housing and actuated by said rotor, said control valve being fixed onto said valve shaft;

said stator comprising first and second stator cores, each having a stator coil and a plurality of spaced pole pieces which are arranged along an outer circumferential wall of said rotor and are spaced from the outer circumferential wall of said rotor by a slight distance;

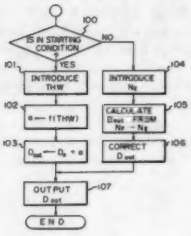
each of said stator cores comprising a first core member having an annular plate, and a second core member having an annular plate, said spaced pole pieces comprising a first pole piece group extending perpendicular to the annular plate of said first core member from an inner periphery of the annular plate of said first core member, and a second pole piece group extending perpendicular to the annular plate of said second core member from an inner periphery of the annular plate of said second core member, each of the pole pieces of said first pole piece group and each of the pole pieces of said second pole piece group being alternately arranged, and each of said pole pieces having a substantially triangular shape.

4,414,943

METHOD OF AND APPARATUS FOR CONTROLLING THE AIR INTAKE OF AN INTERNAL COMBUSTION ENGINE

Masaomi Nagase, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 17, 1981, Ser. No. 303,107
Claims priority, application Japan, Sep. 24, 1980, 55-131454
Int. Cl.³ F02D 9/02, 31/00
U.S. Cl. 123—339 10 Claims



1. A method of controlling the air intake of an internal combustion engine having an intake passage, a throttle valve disposed in the intake passage, and an air bypass passage which interconnects the intake passage at a position located upstream of the throttle valve with the intake passage at a position located located downstream of the throttle valve, said method including the steps of:

detecting the actual rotational speed of the engine to produce a rotational speed signal which corresponds to the detected rotational speed;

by using the produced rotational speed signal, calculating the difference between the actual rotational speed of the engine and a desired idling rotational speed;

calculating a value of a control output signal from said calculated difference;

adjusting, in response to the control output signal, the sectional area of the air bypass passage to control the flow rate of air drawn through the air bypass passage so as to reduce the difference between the actual rotational speed and the desired rotational speed;

detecting whether the engine is in the starting condition or not, to produce a starting condition signal;

in response to the starting condition signal, when the engine is in the starting condition, calculating a modified value of the control output signal by adding an increment value to a base value which corresponds to an optimum control output signal value in the stable idling condition, said base value being a predetermined fixed value; and

when the engine is in the starting condition, adjusting, in response to the modified control output signal calculated during the starting condition, the sectional area of the air bypass passage to control the flow rate of air drawn through the air bypass passage.

4,414,944
DEVICE FOR CONTINUOUS INJECTION OF A MIXTURE CONSISTING OF FUEL AND AIR INTO THE INTAKE LINE (OR MANIFOLD) OF AN INTERNAL COMBUSTION ENGINE

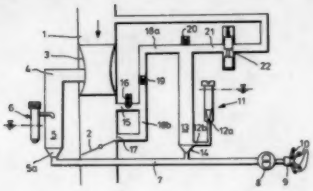
Klaus-Dieter Emmenthal; Otto Schäfer, both of Wolfsburg, and Rudolf-Helmut Strozyk, Helmstedt, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation of Ser. No. 100,444, Dec. 5, 1979, abandoned. This application Jun. 3, 1982, Ser. No. 384,576

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2854988

Int. Cl.³ F02D *33/00*

U.S. Cl. 123—339 **6 Claims**



1. In an apparatus for continuously injecting a mixture of fuel and air into the cylinders of an internal combustion engine, said apparatus including an air intake pipe having an arbitrarily adjustable throttle flap arranged therein, a venturi in said intake pipe at a point upstream of said throttle flap, with an air channel branching off from the narrowest point of the venturi, a main fuel metering means for supplying fuel to the mixing chamber portion of said channel substantially as a function of the air pressure at said venturi, a suction line connected to receive the air and fuel from the mixing chamber in said channel, an idling fuel metering means for supplying fuel under constant pressure to said line during idling, and a fuel delivery pump connected to receive the air and fuel mixture in said line and to supply said mixture to the points of injection associated with the several cylinders of the engine; the improvement comprising a ventilation line associated with an exit orifice of the idling fuel metering means and communicating with a point of at least intermittent negative pressure on said intake pipe of the engine for drawing additional fuel from the idling fuel metering means, said point on said intake pipe comprising at least one port which is within the range of swing of said throttle flap and which, when the throttle flap is closed, is shut off from the portion of said intake pipe situated downstream from said throttle flap and which is acted upon by negative pressure, but wherein said port communicates with said lower portion of the intake pipe, which is acted upon by negative pressure, when the throttle flap is at least partly opened.

4,414,945
DUAL-RANGE MECHANICAL GOVERNOR FOR FUEL INJECTION PUMPS

Jean-Claude Bonin, Blois, France, assignor to CAV RotoDiesel, Blois, France

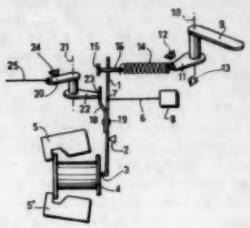
Filed Jan. 25, 1978, Ser. No. 872,177

Claims priority, application France, Feb. 2, 1977, 77 02918

Int. Cl.³ F02D *1/04*

U.S. Cl. 123—368 **5 Claims**

1. A dual-range mechanical governor for the fuel injection pump of an internal combustion engine having a metering member for controlling the amount of fuel supplied by the pump to the engine, comprising engine speed responsive means, an engine speed responsive lever actuated by the engine speed responsive means and rigidly connected to the metering member to move the same and decrease said fuel amount in consequence of engine acceleration, a manually adjustable speed control lever movable between low speed and high speed positions, a high speed spring connected at opposite ends between said speed responsive lever and said speed control lever, one of said connections being a lost motion connection, said high speed spring exerting a biasing force on said speed responsive lever to increase the amount of fuel supplied by the pump when said lost motion connection is operative, an idling speed spring having one end connected to said speed responsive lever and movable stop means independent of the control lever engagng the other end of said idling speed spring, said



idling speed spring exerting a biasing force on said speed responsive lever to increase the amount of fuel supplied by the pump when engaged by the stop means, said lost motion connection permitting movement of the speed responsive lever by the idling speed spring when engaged by the stop means without movement of the speed control lever but which is operative to move said speed responsive lever when said speed control lever is moved towards is high speed position.

4,414,946
CONTROL SYSTEM FOR AN OPERATING EVENT IN A VEHICULAR POWER TRAIN

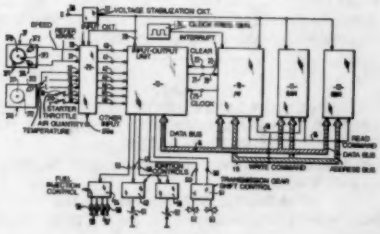
Rolf Däumer, Weil der Stadt; Winfried Klötzner, Maulbronn, and Manfred Schenk, Fellbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,507

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100825

Int. Cl.³ G06F *15/20;* **G05B** *15/02;* **F02D** *5/02*

U.S. Cl. 123—417 **10 Claims**



1. For combination with a vehicular power train,

a control system to control an operating event within said power train and having a rotating shaft, said control system having

a microprocessor unit (**10**);

an input/output (I/O) unit (**13**);

a data bus system (**10**) interconnecting the microprocessor unit and the input/output unit;

a plurality of input sensor elements (**37, 310, 372, 374, 313,** T, L, **38, 39, 29***a*) providing sensing signals representative of operating parameters of the power train, connected to and providing said sensing signals to the input/output unit,

one of said input sensor elements (**370, 372**) forming a crank-

shaft angle increment transducer (37) providing a train of crankshaft increment signals;

a plurality of output stages (49, 50, 54, 61) for carrying out operating commands connected to and controlled by the input/output unit;

a crankshaft angle increment counter (71) connected to receive said crankshaft angle increment signal train and counting the pulses of said pulse train at a rate determined by the frequency of said pulse train;

a first comparator (83) connected to the angle increment counter and to the data bus to receive a comparison signal from the data bus (14) and providing a first output signal when the count output from said angle increment counter (71) and from the data bus have a predetermined relationship,

said output signal being connected to at least one of the output stages to control operation thereof;

a second comparator (87) connected to the angle increment counter (71) and to the data bus (14) to receive a comparison signal from the data bus and providing a second output signal when the count output from the angle increment counter and from the data bus have a second predetermined relationship;

a second counter (100) having its output connected to the data bus (14) to provide output signals thereto for processing in the microprocessor unit (10) in accordance with a selected parameter or value, as determined by the signal applied to the second comparator (87) from the data bus,

and comprising, in accordance with the invention,

a timing circuit (108) providing timing signals;

and transfer switch means (99) having its switching state controlled by data from the data bus (14) and transferring to the second counter (100), selectively, and in accordance with the switching state thereof,

(a) the output signals from said second comparator (87), or

(b) the timing signals from the timing circuit (108),

to control the counting cycle of the second counter (100) selectively by

(a) the parameter-dependent pulse train derived from the second comparator (87), as counted by said angle increment counter (71), or

(b) the timing interval of the timing circuit (108),

and wherein the angle increment counter (71), the second counter (100), said first and second comparators (85, 87) and the timing circuit (108) form part of the input/output unit, to permit the input/output unit to provide data to the data bus, and hence to the microprocessor, selectively, based on signals processed by a single shaft angle increment counter (71) or, selectively, based on time intervals determined by said timing circuit (108).

4,414,947

FUEL INJECTION SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES, HAVING HIGH INJECTION PRESSURE

Hisashi Nakamura, Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

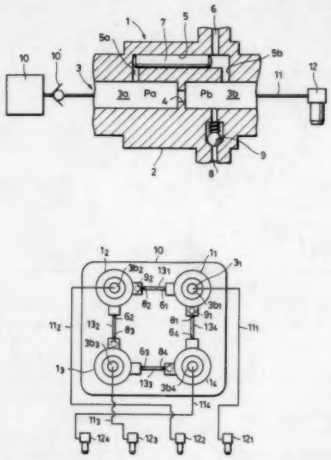
Filed Jul. 12, 1982, Ser. No. 397,165

Claims priority, application Japan, Jul. 17, 1981, 56-111737

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—446 **2 Claims**

1. A fuel injection system for an internal combustion engine having a plurality of cylinders, comprising: a fuel injection pump having delivery valves corresponding in number to the cylinders of the engine; injection nozzles disposed to inject fuel into the cylinders of the engine; injection pipes connected to said injection nozzles; a plurality of control means corresponding in number to the cylinders of the engine and each connected between each of said delivery valves and a corresponding one of said injection pipes, said control means being interconnected in an arrangement corresponding to a predetermined sequence of fuel injection through said delivery valves for allowing transfer of injecting fuel pressure present in each one of said control means to a next one thereof, said control means each including a first valve responsive to differential pressure between injecting fuel pressure present therein on a side of said control means toward said fuel injection pump and fuel pressure present therein on another side of said control means toward a corresponding one of said injection nozzles, to interrupt transfer of the injecting fuel pressure on said corresponding injection nozzle side to a next one of said control means when the injecting fuel pressure on said fuel injection pump side is higher than the injecting fuel pressure on said corresponding injection nozzle side during each fuel delivery stroke of said fuel injection pump, and to allow transfer of the injecting fuel pressure on said corresponding injection nozzle



side to said next control means when the fuel pressure on said corresponding injection nozzle side exceeds the injecting fuel pressure on said fuel injection pump side at the termination of the fuel delivery stroke of said fuel injection pump, and a second valve disposed to prevent backflow of the injecting fuel pressure transferred to said next control means, whereby during a fuel delivery stroke of said fuel injection pump immediately following said first-mentioned fuel delivery stroke, the injecting fuel pressure transferred to said next control means is supplied to another one of said injection nozzles corresponding to said next control means, together with injecting fuel pressure newly delivered by said fuel injection pump.

4,414,948

APPARATUS FOR FORMING THE OPERATING MIXTURE, IN PARTICULAR FOR MIXTURE COMPRESSING INTERNAL COMBUSTION ENGINES HAVING EXTERNALLY SUPPLIED IGNITION

Siegfried Holzbaur, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,305

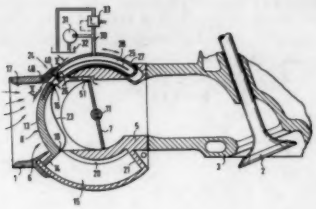
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218211

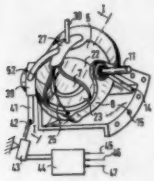
Int. Cl.³ F02M *39/00*

U.S. Cl. 123—452 **8 Claims**

1. An apparatus for forming the operating mixture for mixture-compressing internal combustion engines having externally supplied ignition, said apparatus further including an air measuring device which has at least one control body arranged to block the cross section of an intake tube provided with a zone and deflectable counter to a restoring force in accordance with air flow which is controlled by a throttle device, said control body further arranged to open said intake tube cross section to a greater or lesser extent, and said deflection of said

control body adapted to directly control a fuel metering valve, characterized in that said control body and said throttle device are rotably supported coaxially relative to each other and further that said control body has both a circularly curved control section which protrudes into said intake tube cross





section and an actuation section having oppositely disposed surfaces, said actuation section arranged to protrude into an actuation chamber and wherein one of said oppositely disposed surfaces of said actuation section is exposed to an upstream pressure and another of said sections is exposed to a downstream pressure in said intake tube.

4,414,949

APPARATUS FOR THE CONTROL OF REPETITIVE EVENTS DEPENDENT ON OPERATING PARAMETERS OF INTERNAL COMBUSTION ENGINES

Günther Hönig, Ditzingen; Uwe Kiencke, Ludwigsburg, and Alfred Schulz, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP79/00069, § 371 Date May 5, 1980, § 102(e) Date Apr. 28, 1980, PCT Pub. No. WO80/00597, PCT Pub. Date Apr. 3, 1980

PCT Filed Sep. 5, 1979, Ser. No. 196,914

Claims priority, application Fed. Rep. of Germany, May 9, 1978, 2838619

Int. Cl.³ F02P *5/04*; F02B *3/00*

U.S. Cl. 123—479 **4 Claims**

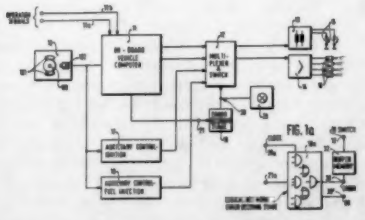


FIG. 1a

1. Apparatus for controlling repetitive events dependent upon operating parameters of a vehicular internal combustion engine, and including at least one of:

ignition events; fuel injection events; transmission events, comprising

a vehicular computer (**11**);

means (**11*a*, 11*b***) applying vehicle operation signals to the computer;

an engine rotation sensor (**10**) coupled to a rotating shaft of the engine, said sensor being connected to and applying engine rotation signals to the computer,

the computer generating control signals in dependence on the signals applied thereto in accordance with a program stored therein;

at least one output control stage (**13, 14**) for triggering the event or events to be controlled;

at least one auxiliary control device (**17, 18**) connected to the engine rotation sensor and receiving the engine rotation signals;

a controllable switching device (**12**) having its output connected to the input of the at least one output control stage (**13, 14**) and inputs, respectively, connected to the output of the computer (**11**) and to the auxiliary control device, or devices (**17, 18**) and operative to selectively switch the output to one of the inputs;

an error decoding stage (**19**) connected to the computer, said error decoding stage including a clock source (**29**);

a shift register (**22, 23, 24, 25**) serially decoding signal sequences applied to the error decoding stage by the computer, and logic means (**28**) connected to the register, the register being periodically interrogated if the contents thereof match the logic conditions determined by the logic means.

4,414,950

FAIL SAFE DEVICE FOR AIR/FUEL RATIO FEEDBACK CONTROL SYSTEM

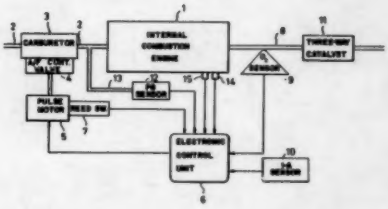
Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1981, Ser. No. 307,445

Claims priority, application Japan, Oct. 6, 1980, 55-140046

Int. Cl.³ F02B *33/00*; F02M *7/00*

U.S. Cl. 123—479 **3 Claims**



1. In an air/fuel ratio feedback control system for performing feedback control of the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine, said system comprising: a sensor for detecting the concentration of an exhaust gas ingredient emitted from said engine; an air/fuel ratio control valve having a valve body position thereof disposed to determine the air/fuel ratio of said air/fuel mixture being supplied to said engine; an actuator arranged to displace said air/fuel ratio control valve in a continuous manner in response to an output signal generated by said sensor; and reference position detecting means for generating a first signal when said actuator passes a predetermined reference position provided between two opposite extreme operating positions which mechanically limit a movable range of said actuator, a fail safe device comprising first means for detecting a failure in said air/fuel ratio feedback control system and generating a second signal when said failure is detected; and second means responsive to said second signal to drive said actuator, said

second means being adapted to stop said actuator at said predetermined reference position immediately upon being supplied with said first signal while it is driving said actuator, said second means including means for repeatedly driving said actuator over a predetermined operating range inclusive of said predetermined reference position in one direction and in a direction reverse thereto alternately a plurality of times when it is not supplied with said first signal upon said actuator passing said predetermined reference position, and means for driving said actuator from a second predetermined reference position which is one of said extreme operating positions, to a predetermined position and holding te same there when it is not supplied with said first signal even after a predetermined number of times of said repeated driving of said actuator.

4,414,951

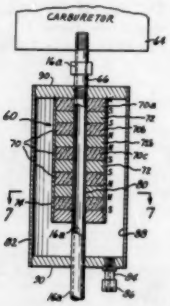
VEHICLE FUEL CONDITIONING APPARATUS

Frank Sancto, P.O. Box 21421, Los Angeles, Calif. 90021

Continuation-in-part of Ser. No. 230,649, Feb. 2, 1981. This application Aug. 6, 1981, Ser. No. 290,660

Int. Cl.³ F02B *75/10*

U.S. Cl. 123—538 **20 Claims**



1. In combination a vehicle fuel system and a vehicle fuel conditioning apparatus for improved combustion of hydrocarbon fuel tending to acquire electrostatic charge during vehicle tank storage which charge inhibits full atomization of the fuel when mixed with air for combustion, said apparatus, being positioned between the vehicle tank storage and a fuel atomizing device and comprising an axial assembly of discrete magnetic bodies individually spaced by non magnetic spacers and arranged to define magnetic flux means providing an axially extended flux condition in said hydrocarbon fuel immediately in advance of fuel atomization, means maintaining said bodies in assembled relation, means defining a closed volume about said assembled bodies, and an inert gas within said closed volume means, said flux condition being adapted to strip electrostatic charge from fuel passing therethrough in subsequent fuel atomization facilitating relation, whereby fuel combustion is improved.

4,414,952

ACTUATOR FOR AN AIR VALVE PLACED IN THE BOOST AIR DUCT OF AN IC ENGINE

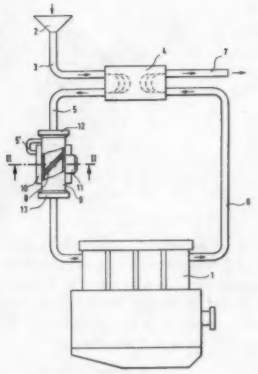
Reinhard Fried, Nussbaumen, Switzerland; Rudolf Heller, Munich, and Heimo Hubner, Greifenberg, both of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft, Brown, Boveri & Cie., Baden, Switzerland and Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

PCT No. PCT/DE80/00078, § 371 Date Feb. 8, 1981, § 102(e) Date Feb. 4, 1981, PCT Pub. No. WO80/02725, PCT Pub. Date Dec. 11, 1980

PCT Filed May 23, 1980, Ser. No. 232,025

Int. Cl.³ F02B *33/02*

U.S. Cl. 123—559 **20 Claims**



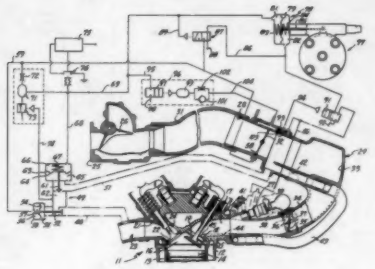
1. An apparatus for actuating an air throttle valve in the intake manifold of an internal combustion engine, particularly such an engine super-charged by a pressure wave supercharger, an air throttle valve disposed in an intake manifold and moveable between open and closed positions, spring means operatively connected to said air throttle valve for maintaining said air throttle valve in its closed position while the engine is shut off and while the engine is in a cold starting phase, during the cold starting phase there is a build-up in pressure of charge air in the intake manifold in front of the closed air throttle valve, a breather valve by-passing said air throttle valve to supply the engine with charge air around the closed air throttle valve, a pneumatic actuator operatively connected to said air throttle valve and operable by one of a pressure and a vacuum, said spring means being so selected and said actuator being so constructed that the charge air pressure accumulated in front of the closed air throttle valve at the end of the cold starting phase is sufficient to initiate the opening movement of the air throttle valve against the force of said spring means, said air throttle valve being further moved into its full open position by means of one of the charge air pressure and a vacuum, said air throttle valve being maintained in said open position while the engine is running, said air throttle valve returning to its closed position under the force of said spring means after the engine is shut down.

4,414,953

INTERNAL COMBUSTION ENGINE WITH EXHAUST GAS RECYCLING SYSTEM

Hiromitsu Matsumoto, Hamamatsu, and Keiichi Sugiyama, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 88,466, Oct. 26, 1979, Pat. No. 4,306,533.
This application Oct. 19, 1981, Ser. No. 312,920
Claims priority, application Japan, Oct. 26, 1978, 53-132002
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 2 Claims



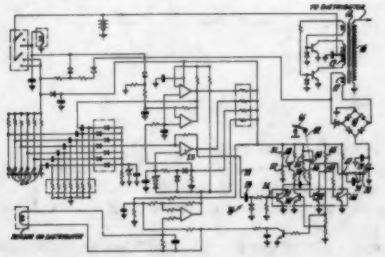
1. In an internal combustion engine having a chamber of variable volume in which combustion occurs, a spark plug for firing a charge in said chamber, a main induction passage for supplying a charge to said chamber, an auxiliary induction passage having a significantly lesser effective cross sectional area than said main induction passage for delivering a charge to the chamber at a significantly greater velocity than the main induction passage, control valve means for controlling the proportion of the charge delivered to the chamber through the respective induction passages, exhaust gas recirculating means for recirculating a portion of the exhaust gases from the chamber back to the chamber, exhaust gas recirculation control valve means for controlling the amount of exhaust gases recirculated to said chamber, and spark timing means for delivering a timed spark to said spark plug, the improvement comprising means for advancing the timing of the spark delivered by said spark timing means in response to the recirculating of exhaust gases by said exhaust gas recirculating means.

4,414,954

INTERNAL COMBUSTION ENGINE IGNITION SYSTEM WITH IMPROVEMENT

Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed May 27, 1982, Ser. No. 382,545
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—606 4 Claims



1. In combination, an internal combustion engine having a crank shaft and a fuel control arm and an electronic ignition circuit, said ignition circuit having a transformer with center tapped primary winding forming an oscillator to develop a continuous high-voltage AC type spark signal of variable duration, said circuit including a control winding on said transformer for starting and stopping said oscillator and electronic switch means comprising a controlled rectifier for starting and stopping said spark signal, and

control means for said controlled rectifier, comprising

a transistor network having an input for receiving ignition control pulses in timed relation to said crank shaft and an output for controlling said controlled rectifier,

said transistor network comprising

means for cutting off said controlled rectifier to start said spark signals in timed relation to said crank shaft,

said transistor network also comprising means for actuating said controlled rectifier to conduct in order to stop said spark signals after a variable time interval inversely related to the speed of said engine,

said transistor network having circuit constants to provide a duration of said spark signals having a predetermined number of degrees of crank shaft rotation, and

said transistor network also comprising means for varying one of said circuit constants to control said variable time interval, comprising

a variable resistor,

a coupling to said fuel control arm for varying said variable resistor, and

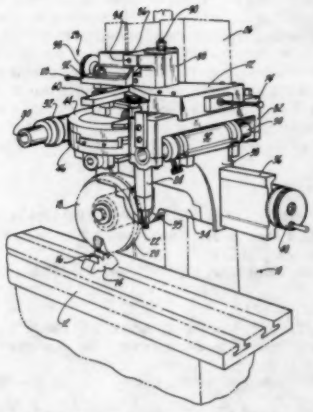
a fixed resistor in series with said variable resistor to determine a minimum number of degrees of crank shaft rotation.

4,414,955

APPARATUS FOR DRESSING ABRASIVE WHEELS

Lothar P. Bunge, 26648 Ryan, Warren, Mich. 48091

Filed Nov. 12, 1981, Ser. No. 320,276
Int. Cl.³ B24B *53/00*
U.S. Cl. 125—11 T 22 Claims



1. Apparatus for dressing a wheel, comprising:

a base;

a support;

means for mounting said support on said base including means for rotatably mounting said support relative to said wheel about a first axis;

a carriage having a pair of opposed guide surfaces;

a dressing tool attached to said carriage for movement therewith and extending outwardly from one side of said support;

means for slidably mounting said carriage on the other side

of said support, said carriage being rotatable with said support; and

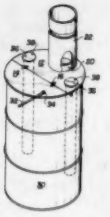
a frame assembly including first and second frame portions rotatable relative to each other about a second axis substantially parallel to said first axis, a cylindrical disc mounted on said first frame portion and having a section of the periphery thereof bearing against one of said opposing guide surfaces, and a pair of spaced apart rollers mounted on said second frame portion and bearing against the other of said guide surfaces.

4,414,956

HEATER CLOSURE ATTACHMENT FOR DRUMS

Furman L. Webber, 116 Delinger Rd., Shelby, N.C. 28150

Filed May 21, 1981, Ser. No. 266,096
Int. Cl.³ F24C *1/16*
U.S. Cl. 126—59 **5 Claims**



1. A closure attachment for empty metallic cylindrical open top drums to form therewith a portable outdoor drum heater comprising, in combination, a metal top closure unit adapted to rest on the open top of the drum when in upright position; said top closure unit having a large exhaust opening and air inlet opening means; a manually openable fuel insertion door comprising a hinged portion of the top closure unit; and air inlet tubing comprising two tubes disposed on opposite sides of the drum depending from said air inlet opening means having a length extending to a position adjacent the bottom of said drum thereby to provide turbulent inlet air in a position under fuel placed in the drum for efficient and rapid burning of the fuel wherein the closure unit comprises a knock-down set of parts with two sleeves about two apertures in the closure unit constituting the air inlet opening means and means for removably securing to the sleeves the two air inlet tubes.

4,414,957

FIREPLACE AND STOVE APPARATUS

Jeffrey L. Evans, Aspen, Colo., assignor to Ting Enterprises, Inc., Aspen, Colo.

Filed Mar. 17, 1982, Ser. No. 359,061
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—121 **19 Claims**

1. A solid fuel burning apparatus for use in an enclosure having an exhaust flue, a combustion chamber, and a fuel-loading opening, comprising:

means for substantially air-tightly sealing the fuel-loading opening;

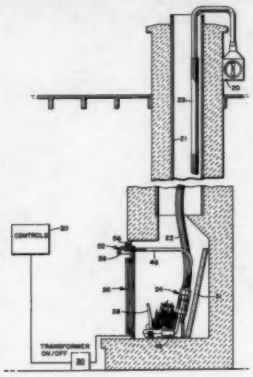
a hollow, fuel-holding grate having an air inlet opening thereinto at the rear thereof, a first air outlet opening therefrom through which air is directed directly toward the fuel, and a plurality of second air outlet openings therefrom at the rear of the grate through which air is fed exterior of said combustion chamber into the enclosure, said grate having air passage means therein fluidly connecting said inlet to said first and second outlets;

a single variable speed blower means outside of said enclosure, said blower means having an air inlet and an air outlet, the air inlet of said blower means being below the level of the outlet of said exhaust flue;

a first flexible conduit extending through said exhaust flue, said flexible conduit directly fluidly connecting the air outlet of said blower means and said grate air inlet;

a plurality of second flexible conduits each directly fluidly connecting a respective one of said second air outlets and said enclosure through said air-tightly sealing means; and

said passage means extending forwardly from said grate air inlet to adjacent the front of said grate and from there extending rearwardly to said second air outlets so that air moving through said passage means to the exterior of said combustion chamber into said enclosure is heated within said flue and within said passage means over a distance corresponding to at least the length of the flue plus twice the distance between the front of the grate and the second air outlets at the rear of the grate plus the length of the second flexible conduit.

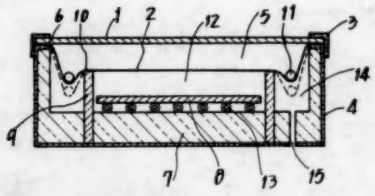


4,414,958

SOLAR COLLECTOR

Shiro Hozumi, Sakai; Shin'ichi Aso, Ikoma; Minoru Tagashira, Katano; Kouji Ebisu, Moriguchi, and Hideo Uchino, Higashiosaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 5, 1980, Ser. No. 213,339
Claims priority, application Japan, Dec. 11, 1979, 54-161104
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—450 **5 Claims**



1. A solar collector comprising:

a heat collecting panel for receiving the sunlight and converting the sunlight to heat,

a cover glass arranged a distance apart from and over the panel,

a vessel having thereon the cover glass and accomodating therein the panel,

a sunlight-pervious diaphragm disposed between the panel and the cover glass to form a closed space between itself and the cover glass, the diaphragm being adapted to ex-

pand and contract to vary the volume of the closed space in response to temperature variations,

pressure equalizing means provided in the vessel on the side of the diaphragm opposite said closed space, and

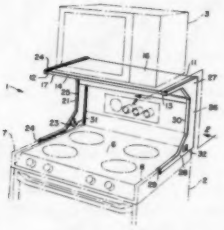
means for limitively stretching the central portion of the diaphragm substantially in parallel to and substantially a predetermined distance above the panel whereby said central portion of the diaphragm remains taut below a specified temperature but is allowed to start sagging at said specified temperature.

4,414,959

SHELF FOR A RANGE

Rickey F. Fair, Sharpsville, and John R. Wilcox, Farrell, both of Pa., assignors to Top Shelf Company, Inc., West Middlesex, Pa.

Filed Dec. 23, 1981, Ser. No. 333,644
Int. Cl.³ F24C *15/16*
U.S. Cl. 126—332 **1 Claim**



1. A shelf for use with a range, said range having a burner area which includes a first drip rail and a second drip rail at opposite sides thereof, said shelf comprising:

(a) a platform having a first end and a second end and further having a front edge, a top surface and a bottom surface;

(b) a first support having an upper portion and a lower portion, said upper portion of said first support being secured to said first end of said platform such that said platform is substantially parallel to said burner area, said lower poriton of said first support having integrally formed therewith a first channel receptive to engaging said first drip rail of said range;

(c) a second support having an upper portion and a lower portion, said upper portion of said second support being secured to said second end of said platform such that said platform is substantially parallel to said burner area, said lower portion of said second support having integrally formed therewith a second channel receptive to engaging said second drip rail of said range;

(d) a stiffening member having a heat reflective surface, said stiffening member being secured to said bottom surface of said platform in proximity to said front edge thereof, said stiffening member being secured also to said first support and to said second support such that said heat reflective surface of said stiffening member is oriented toward said burner area of said range;

(e) a first tab integral with said lower portion of said first support and spaced apart from said first channel, said first tab being able to bear against said first drip rail; and

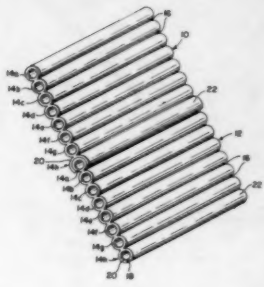
(f) a second tab integral with said lower portion of said second support and spaced apart from said second channel, said second tab being able to bear against said second drip rail.

4,414,960

SOLAR COLLECTION MAT ELEMENT

Kurt J. Wasserman, Westtown, N.Y., assignor to Insolar, Inc., Port Jervis, N.Y.

Filed May 10, 1982, Ser. No. 376,419
Int. Cl.³ F24J *3/02*; F28F *1/00*
U.S. Cl. 126—426 **2 Claims**



1. A pair of substantially identical solar energy collection mat elements each said element comprising an elongated unitary structure of substantially black material selected from elastomerics and flexible plastics and of substantially constant cross-section, configured as a series of side-by-side relatively thin-walled parallel pipes of substantially the same cross sectional dimensions, each pair of adjacent pipes of each mat element being substantially tangent to each other, integral connecting material between each said pair of adjacent pipes defining a longitudinally directed tear line, said series of pipes of each mat element including a first pipe at one extreme side of said series and a last pipe at the opposite extreme side of said series, said last pipe having a longitudinally directed slit in its wall along a line generally most remote from the other of said pipes of said mat element and running the entire length of said last pipe, so as to divide said last pipe into opposed flexible wings of arcuate cross-section, said wings of one of said mat elements grippingly overlapping substantially the entire exterior of the first pipe of the other solar collection mat element, each pipe (of said series) heretofore mentioned with the exception of the last pipe of each mat element being configured for conveying fluid.

4,414,961

SOLAR ENERGY COLLECTING PANEL AND APPARATUS

Robert W. Luebke, 522 Ponte Vedra Blvd., Ponte Vedra, Fla. 32082

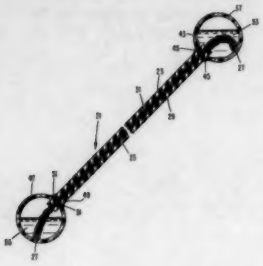
Filed Feb. 18, 1981, Ser. No. 235,741
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—432 **17 Claims**

1. A solar energy collecting panel comprising:

a first layer of heat absorbing material, said material being black and opaque;

fiber means for repeatedly transporting a fluid toward a first surface of the first layer to transfer heat from the layer to the fluid, said fiber means being bonded to said first sur-

face to ensure intimate contact between filaments of the fiber means and the first surface; and



a second layer arranged such that the fiber means is confined between the first and second layers.

4,414,962

OPERATING ARTHROSCOPE

Robert W. Carson, 1419 Circle Way, Salt Lake City, Utah 84103

Continuation-in-part of Ser. No. 806,833, Jun. 15, 1977, and Ser. No. 861,632, Dec. 19, 1977. This application Jan. 2, 1980, Ser. No. 109,150

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **16 Claims**

1. In an arthroscope with structural elements, including a lens system, an instrument channel and a fiber optic lighting system, fixed within a rigid sheath, the improvement which comprises:

providing said sheath in association with a central housing, wherein the sheath includes

a first, terminal, elongated sheath segment extending from said central housing said terminal segment having a longitudinal axis; and

a second, viewing, elongated sheath segment carrying an eye piece at its distal end, extending in a direction opposite said terminal segment from said central housing at a location laterally offset from but approximately adjacent the longitudinal axis of said terminal segment, wherein

said viewing segment is longer than said terminal segment, and

said instrument channel is contained by said terminal sheath segment, and terminates with an entry, adapted to pass instruments from outside, at said central housing at a location offset from said viewing segment and spaced from said eye piece approximately the length of said viewing sheath segment;

the relative length of said terminal and viewing sheath segments, and the spatial arrangement of said eye piece and said entry being selected so that blind manipulations of instruments through said instrument channel may be accomplished by an operator looking through the eye piece with said operator's hands in front of the operator's torso and below the shoulder level of said operator.

4,414,963

MASSAGE DEVICES

Raymond W. Kunz, Monroe, Conn., assignor to Clairol Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 41,277, May 21, 1979, abandoned. This application Apr. 9, 1980, Ser. No. 138,488

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—60 **12 Claims**

1. A massage head mechanism comprising

a massage head of generally short conical shape having a post fixedly attached essentially perpendicularly to the base of the head,

a rotatable driver,

a socket fixedly attached to said driver at an angle thereto and rotatable therewith, wherein said post is rotatably fitted into said socket and said post has an outside diameter smaller than the inside diameter of said socket to permit rotational slippage therebetween,

resisting means cooperating with said massage head to enable the massage head to nutate without rotating when said driver is rotating.

4,414,964

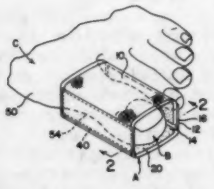
POST-OPERATIVE TOE PROTECTOR DEVICE

Frank G. Farino, Shaker Heights, Ohio, and Richard P. Jacoby, Paradise Valley, Ariz., assignors to Richard P. Jacoby, Phoeniz, Ariz.

Filed Jan. 19, 1981, Ser. No. 226,365

Int. Cl.³ A61F *5/00*; A61B *19/00*

U.S. Cl. 128—81 R **10 Claims**



1. A device presenting a plurality of pads, one each engaging the upper, the lower, and the two sides of a human toe respectively to form a protective shield thereabout, said device comprising a generally rectangular strip having a transverse direction generally parallel the shorter edges thereof and an upper and a lower surface extending between a first end portion and a second end portion; a layer of cushion material secured to said upper surface; a layer of looped-type woven fabric secured to said lower surface; means associated with said layered strip and coacting therewith to define transversely extending fold lines thereacross in spaced generally parallel relationship

to each other to divide said cushion layer into a plurality of discrete pads which, when each one of said pads is disposed generally normal to each pad contiguous thereto on the fold line interposed therebetween, create a hollow rectangular member having said pads disposed therein; and means for detachably securing said rectangular member about a human toe to provide a protective shield therefor with each of said pads engaging, but not constricting, its contiguous surface of said toe.

4,414,965

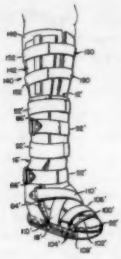
BRACE FOR TIBIAL FRACTURES

Donald M. Mauldin, 3631 Potomac, Dallas, Tex. 75235, and Richard E. Jones, III, 5804 Prestonview, Dallas, Tex. 75240

Continuation-in-part of Ser. No. 266,966, May 26, 1981, Pat. No. 4,378,793. This application Sep. 29, 1982, Ser. No. 426,851

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—87 R **3 Claims**



1. A brace for treatment of tibial fractures comprising:

a rigid shoe having a planar upper surface for engaging the sole of the patient's foot, side walls extending perpendicularly to the upper surface and downwardly therefrom, and an outer sole comprising the lowermost surface of the shoe;

the outer sole of the shoe having a fulcrum, a planar first portion extending rearwardly from the fulcrum to the heel of the shoe and a second portion comprising a continuous curve extending from the fulcrum upwardly and forwardly to the toe of the shoe;

means for locating the foot of the patient on the planar upper surface of the shoe with the metatarsal point of the foot positioned forward of the fulcrum so that the shoe normally sets on the planar first portion of the outer sole and pivots about the fulcrum onto the curved second portion as the weight of the patient shifts forward of the metatarsal point of the foot;

left and right side members positioned on opposite sides of the shoe and each including a thermoplastic side piece and a metal ankle stay;

the metal ankle stay of each side member engaging the adjacent side wall of the shoe and extending upwardly therefrom beyond the ankle of the patient;

the thermoplastic side piece of each side member surrounding the metal ankle stay thereof on the front, on the outside, and on the rear and extending upwardly from the shoe in contact with the metal ankle stay;

means securing the metal ankle stay of each side member to the side piece thereof;

a plurality of fasteners extending through the metal ankle stay and the thermoplastic side piece of each side member and into the adjacent side wall of the shoe for rigidly securing the side members to the shoe;

the metal ankle stay and the thermoplastic side piece of each side member comprising a first portion secured to the side wall of the shoe, a second portion extending from the upper end of the first portion angularly upwardly and outwardly with respect thereto and a third portion extending upwardly from the upper end of the second portion substantially parallel to the first portion;

the metal ankle stay of each side member terminating at the upper end of the third portion thereof;

the thermoplastic side piece of each side member further including a fourth portion extending from the end of the third portion angularly upwardly and inwardly with respect thereto and a fifth portion extending upwardly from the upper end of the fourth position generally parallel to the first and third portions;

the fifth portion of each side piece being positioned over the first portion thereof and being curved inwardly to conform to the calf of the patient;

each side member further including a layer of foam padding secured to the inside surface thereof and extending upwardly along the inner surfaces of the second and third portions of the metal ankle stay and the thermoplastic ankle piece;

a pair of extensions each secured to the upper end of the fifth portion of one of the side pieces and extending therefrom upwardly beyond the knee of the patient; and

fastening means for securing the shoe, the side members and the extension in place relative to the leg of the patient.

4,414,966

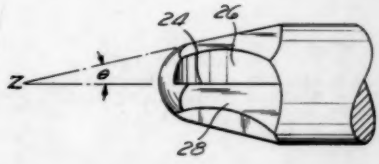
FIXATION PIN

Denis P. Stednitz, Redondo Beach, Calif., assignor to Ace Orthopedic Manufacturing, Inc., Los Angeles, Calif.

Filed Apr. 9, 1981, Ser. No. 252,359

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—92 B **7 Claims**



1. In an orthopedic fixation pin adapted to be threadably attached adjacent the distal end with a bone of the user patient and to be attached to a fixation frame adjacent the proximal end thereof, the pin comprising an elongate cylindrical shaft having threads formed at the distal end thereof for attachment to the bone, the improvement wherein the threaded distal end of the pin comprises;

a symmetrical hemispherical dull tip portion having a maximum diameter less than the diameter of the shaft;

a transition portion of increasing diameter between the tip portion and the shaft;

threads formed on the pin from the tip portion through the transition portion and onto the shaft adjacent the transition portion;

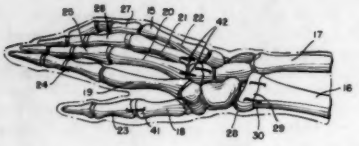
at least two flutes formed in the tip and transition portions, each of said flutes being defined by first and second surfaces, the first surface being generally planar and lying substantially in coincidence with a radius of the shaft and extending longitudinally from proximate the distal end of the transition portion to proximate the proximal end of the transition portion of the pin, the second surface being longitudinally generally coextensive with the first surface and curving from a surface coincident to a chord proximate the center of the shaft outwardly to terminate at a tangent to the shaft, the flutes being substantially symmetrically arranged about the axis of the shaft and so configured and constructed as to form non-fluted spaces therebetween;

the non-fluted surfaces between the flutes being substantially flat to form a self-tapping cutting edge for the threads on the pin.

4,414,967
INTERNAL FIXATION OF BONE, TENDON, AND LIGAMENTS

Jules S. Shapiro, Evanston, Ill., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 22, 1981, Ser. No. 275,896
Int. Cl.[3] A61F *5/04;* A61B *17/04*
U.S. Cl. 128—92 B 9 Claims

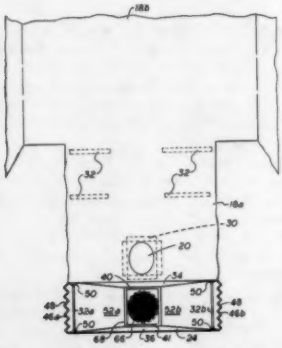


1. A method of fixation for two portions of bone comprising the steps of:
(a) holding the bone portions together;
(b) placing a stapler over the bone portions;
(c) activating the stapler to rapidly release stored energy;
(d) rapidly and reproducibly imparting a controlled amount of the released energy to a staple thereby propelling the staple, the staple comprising at least a pair of prongs and means for connecting the prongs; and
(e) guiding the propelled staple towards the bone portions whereby at least one prong of the staple is driven by momentum into and frictionally fits within each of the bone portions.

4,414,968
SURGICAL DRAPE

Shailesh R. Amin, 1417 Golf Ter., Danville, Ill. 61832

Filed May 29, 1981, Ser. No. 268,367
Int. Cl.[3] A61F *13/00*
U.S. Cl. 128—132 D 2 Claims

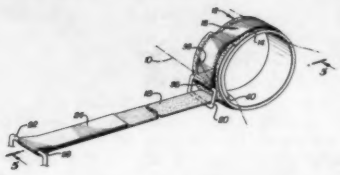


1. A drape for covering the body of a patient during a medical procedure, comprising:
a sheet of drapable material having a fenestration for access to the site of the procedure;
a foldable pocket carried by the sheet at a location in the path of fluid runoff from the fenestration and having a pair of opposite sides;
a frame member insertable into the pocket for maintaining the foldable pocket in an open position to receive the fluid runoff; and
means carried by said pocket for holding said frame member in an operable position adjacent either of said sides.

4,414,969
WRIST RESTRAINT

Arnold M. Heyman, Burbank, Calif.

Filed Mar. 25, 1981, Ser. No. 247,270
Int. Cl.[3] A61F *13/00*
U.S. Cl. 128—133 12 Claims



1. A device for restraining a patient's limb or other body part comprising:
a generally rectangular, flexible encircling member of a length sufficient to encircle the limb of the patient beginning with a second end, said member having an outside surface which contains Velcro pile along substantially its entire length;
a securing strap means having a first end for peripherally holding said encircling member about said limb and having a second end for attachment to a support structure, said strap means being attached adjacent said first end to a first end of said encircling member and containing Velcro hook fibers on one surface along substantially its entire length for releasably engaging the Velcro pile located on the outside surface of said encircling member; said encircling member and securing strap means being configured and attached so that in elongated form, with said securing strap means extending beyond said first end of said encircling member, said surface of said securing strap means containing Velcro hook fibers faces in a direction opposite to that faced by the surface of said encircling member containing Velcro pile;
a ring pivotally attached to the surface of said encircling member containing Velcro pile at a position adjacent the attachment of said strap means; and
a fastening means contained on said strap means for releasably attaching the second end of said securing strap means to a structure, whereby a limb is restrained by extending the encircling member and securing strap means around said limb beginning with the second end of said encircling member so that said securing strap means extends peripherally around said encircling member to hold it in place by means of the engagement of said Velcro hook fibers and said Velcro pile, and by passing the second end of said securing strap means through said ring, directing it towards a support structure and attaching said second end about the support structure using said fastening means.

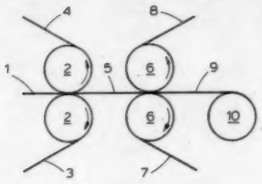
4,414,970
ELASTIC BANDAGES

Peter W. Berry, Bishops Stortford, England, assignor to Smith and Nephew Associated Companies Limited, United Kingdom

Filed Jul. 24, 1981, Ser. No. 286,567
Claims priority, application United Kingdom, Jul. 30, 1980, 8024855; Aug. 27, 1980, 8027719
Int. Cl.[3] A61L *15/00*
U.S. Cl. 128—156 12 Claims

1. A moisture vapour transmitting elastic bandage which comprises an inner layer of fabric and an outer layer of fabric bonded to a central layer, said central layer comprising an

apertured elastomeric film which allows the passage of wound exudate from the inner layer to the outer layer and whereby



the bandage has a recoverable elastic strain in the length direction of 25% to 150% at a stress of 180 g/cm.

4,414,971

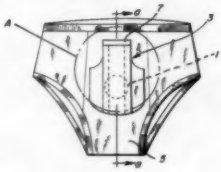
SANITARY PANTS USED FOR THE MALE

Seun Y. Chung, 309-1, Da, Shi Heung Dong, Yeung Deung Po-Ku, Seoul, Rep. of Korea

Filed Jun. 2, 1981, Ser. No. 269,745

Int. Cl.³ A61F *5/40*

U.S. Cl. 128—159 **5 Claims**



1. Sanitary underpants for the male which provide effective ventilation and absorption, said pants having a front and rear portion, said front portion being provided with a centrally disposed hole, and a unitary exterior cloth fastened to said front portion in the vicinity of the waist and along the sides thereof for surrounding said hole and forming a pouch, said exterior cloth being fastened along the lateral sides thereof to said front portion up to a location just above said hole to form said pouch with said front portion, whereby the genitals of the male are adapted to extend through said hole and be received by said pouch thereby separating said genitals from contiguous body parts, said exterior cloth including side panels which have a pleated expandable configuration for permitting said pouch to be expanded, and said lateral sides of said exterior cloth being unfastened from said location just above said hole up to said vicinity of the waist to provide a vent opening between said exterior cloth and said front portion.

4,414,972

INHALATION DEVICE

David M. Young, Loughborough; Donald F. Mitchell, Diseworth, near Derby, and Edward Amey, Loughborough, all of England, assignors to Fisons Limited, London, England

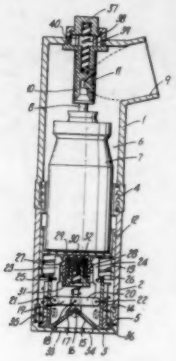
Filed Jul. 29, 1981, Ser. No. 287,887

Claims priority, application United Kingdom, Aug. 4, 1980, 8025385

Int. Cl.³ A61M *15/00*

U.S. Cl. 128—200.23 **10 Claims**

1. An inhalation device for use with a pressurised container having an outlet valve mechanism and from which material may be discharged by depression of a portion of the valve mechanism thereof, which device comprises a chamber for receiving said pressurised container; a mouthpiece communicating with said chamber and an air flow passage means through said chamber and mouthpiece; actuating means adapted to bear on the valve mechanism of the container without actuating the valve mechanism; and first and second biasing means both adapted to bias the container towards the actuating means, said first and second biasing means each being of insufficient force alone to depress the portion of the valve mechanism of the container against the actuating means but



together being of sufficient force to do so, said first biasing means being positioned to provide a continuous bias on the container toward said actuating means; and means for restraining said second biasing means in a position in which it does not bear on the container and releasing said second biasing means on inhalation through the device to a position in which it does bear on the container.

4,414,973

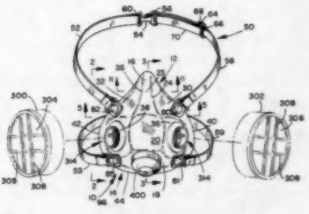
RESPIRATOR FACE MASK

James N. Matheson, Mission Viejo, and Philip L. Lowry, Santa Ana, both of Calif., assignors to U.S.D. Corp., Santa Ana, Calif.

Filed Mar. 10, 1981, Ser. No. 242,287

Int. Cl.³ A62B *7/00*

U.S. Cl. 128—206.15 **7 Claims**



1. An improved respirator having a facial configuration for covering the oral and nasal areas of a user's face where the improvement comprises:

a respirator mask having a peripheral edge adapted to lie about the oral nasal area of a user's face and an oral and nasal cavity;

passage means for attaching at least one air filtration cartridge to said respirator mask;

inhalation valve means in said passage which upon exhalation will close off the cartridge passage means;

an outlet in said mask having an exhalation valve for exhausting air from a user's lungs;

sealing means extending around the peripheral edge of said mask for sealing the oral nasal cavity when positive or

negative pressure is applied internally thereto when the respirator is on one's face; and,

support means for holding said respirator on a user's face formed with a resilient post attached to said respirator mask having a resilient enlarged head, and an eyelet having an opening which fits snugly about said post removably mounted over said head with a strap attached to said eyelet for attachment to a second resilient post having a resilient enlarged head attached to said respirator mask with an eyelet having an opening which fits snugly about said second post at the other end of said strap removably mounted on said second post, and wherein said heads have an eccentrically shaped portion for overlying a portion of said eyelet and an undercut thereto providing pivotal movement of said eyelet beneath said undercut around said post for various pivotal orientations of the strap.

4,414,974

MICROSURGICAL KNIFE

Robert S. Dotson, Manhattan, Kans.; W. George Richeson, Marietta, Ga., and Herb M. Trenka, Clearwater, Fla., assignors to General Conveyors Limited, Stamford, United Kingdom

Filed Jun. 9, 1981, Ser. No. 271,967
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—305 **7 Claims**

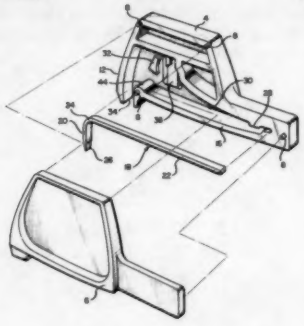
1. A disposable microsurgical knife comprising an elongate knife body having a forward end and a rearward end, a cutting blade carried at said forward end and extending therefrom, and a shroud slidably received over said knife body, said shroud being selectively slidable towards and rearward end for exposing said cutting blade and providing a blade using position and slidable over said forward end for covering said cutting blade and providing a blade protecting position, said forward end of said knife body defining a slot therein, said slot having generally parallel side walls, said cutting blade including a cutting portion and a shank carrying said cutting portion, said shank having non-parallel edges, said shank being dimensioned to be received within said blade receiving slot to be locked therein by means of said non-parallel edges with said cutting portion extending from said shank beyond said knife body, said forward end of said knife body having a reduced diameter for allowing better visibility of said cutting blade, said rearward end of said knife body being a generally cylindrical portion and carrying an enlarged cap at the rearmost end thereof, said shroud having a non-circular exterior configuration and defining a circular bore therethrough, said generally cylindrical portion having an external diameter sized to cause said shroud to wedge in place when said shroud is slid to said blade using position, said knife body including means for centering said shroud when said shroud is slid to said blade protecting position, said shroud having a length sufficient to be supported by said cylindrical portion of said knife body and to extend beyond said cutting portion of said blade.

4,414,975

BLOOD LANCET

Francis E. Ryder, and Michael D. Thomas, both of Arab, Ala., assignors to Ryder International Corp., Arab, Ala.

Filed May 15, 1981, Ser. No. 264,189
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—314 **3 Claims**



1. A surgical lancet for use in obtaining a blood sample, or the like, said lancet comprising: a housing including a longitudinal side wall having a shoulder formed thereon, which shoulder extends transversely of the interior surface of said side wall; a resiliently biased blade member mounted within said housing, said blade member comprising a resilient strip of metal material including an elongate first portion having one end fixed with respect to the housing, and a relatively short, transverse second portion joined to said first portion at the other end thereof, said second portion including an edge for penetrating a patient's skin, said blade member being capable of being flexed to a first retracted position wherein the edge of said blade is disposed within the housing, with said first portion of the blade member engaged upon said shoulder extending transversely of the interior surface of the housing side wall and said blade member being moveable off said shoulder such that the resiliency of said blade member will cause it to move to a second extended position wherein the edge projects from an opening in said housing; and triggering means selectively operable to move said blade member transversely of the housing side wall and off said shoulder whereby said blade is then free to move from said first retracted position to said second extended position, said triggering means including a resilient tab formed integral with said housing side wall structure adjacent said shoulder, said tab, in its normal unstressed condition not extending inwardly of the interior surface of the housing side wall a sufficient distance to prevent engagement of the blade member on said shoulder, said tab being moveable transversely of said side wall such that said tab may be pressed inwardly to engage against said blade member and to move the blade member transversely of the side wall to disengage said blade member from said shoulder thereby permitting said blade to move from the retracted position to the extended position wherein the edge thereof projects from said housing.

4,414,976
TISSUE ADHESIVE

Otto Schwarz; Yendra Linnau; Franz Löblich, and Thomas Seelich, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft fur chemischmedizinische Produkte, Vienna, Austria

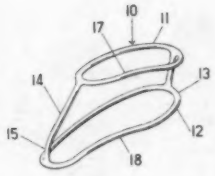
Division of Ser. No. 118,529, Feb. 4, 1980, Pat. No. 4,362,567.
This application Sep. 13, 1982, Ser. No. 417,538
Claims priority, application Austria, Feb. 15, 1979, 1189/79
Int. Cl.³ A61B 17/04
U.S. Cl. 128—334 R 3 Claims

1. A method of seamlessly connecting tissue or organ parts, for sealing wounds, stopping bleeding and stimulating wound healihg in mammals which comprises reconstituting lyophilized tissue adhesive of mammalian protein origin which comprises fibrinogen, albumin, factor XIII, cold-insoluble globulin and plasminogen-activator inhibitor or plasmin inhibitor wherein the fibrinogen is present in at least 33% by weight, in the lyophilized state, the ratio of factor XIII to fibrinogen, expressed in units of factor XIII per gram of fibrinogen is at least 80, and fibrinogen and albumin are present in a ratio of 33 to 90:5 to 40 and applying said reconstituted tissue adhesive containing at least 70 mg of fibrinogen per ml to the organ tissue or wound of a mammal in an amount sufficient to function as an adhesive.

4,414,977
NASAL DILATOR

Saeed Rezakhany, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 20, 1981, Ser. No. 284,654
Int. Cl.³ A61M 29/00; A61F 5/08
U.S. Cl. 128—342 6 Claims



1. A nasal dilator adapted for emplacement in the vestibule of the nose to retain the tissues therein and provide a free air passage, comprising:

(a) a top ring member having a generally elongated oval shape;

(b) a bottom ring member having a generally elongated oval shape and being longer in the elongated dimension than the top ring;

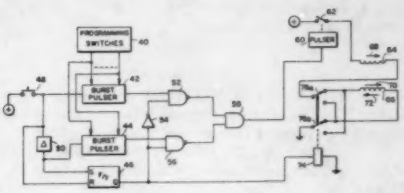
(c) a substantially straight rear strut extending between the rear elongated ends of the top and bottom ring members;

(d) a front strut extending between the front elongated ends of the top and bottom ring members, the front strut being substantially longer than the rear strut and having a bend therein spaced closer to the bottom ring than to the top ring and arranged such that the front strut engages the bottom ring approximately perpendicular to the plane of the bottom ring, the top ring being sized to extend approximately the length of the ostium internum of the human nose, the bottom ring being sized to extend approximately the length of the bottom of the vestibule adjacent to the opening of the nostril, the struts spacing the top ring from the bottom ring a distance approximately equal to the distance from the ostium internum of the nostril to the bottom thereof, the top and bottom rings and the struts being formed of a non-irritating, biocompatible material.

4,414,978
UNIVERSAL PROGRAMMER FOR OPERATING IMPLANTABLE DEVICE REED SWITCH

Victor E. Church, Hornsby Heights, Australia, assignor to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Aug. 26, 1981, Ser. No. 296,458
Int. Cl.³ A61N 1/38
U.S. Cl. 128—419 PG 21 Claims

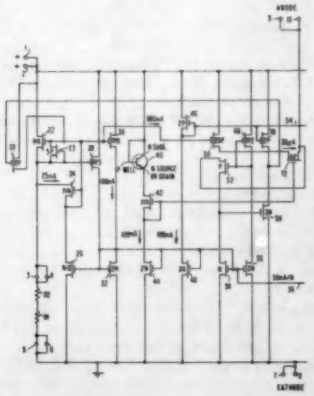


1. A system for generating magnetic flux to control flux-responsive switching in a plurality of medical prostheses to adjust the operating characteristics thereof, such medical prostheses being sensitive to the path of magnetic flux therethrough, a first group of said medical prostheses being responsive to fluxes primarily in a first direction therethrough, and a second group being responsive to fluxes primarily in a second direction therethrough when placed in a human body in the same position as the medical prostheses in said first group; comprising a housing; means within said housing for generating two fluxes having a different paths, each to control flux-responsive switching in medical prostheses in a respective one of said first and second groups when said housing is held in the same orientation relative to the medical prostheses in both groups; and means for selectively controlling the path of the flux which is generated by said flux generating means.

4,414,979
MONITORABLE BONE GROWTH STIMULATOR

Michael S. Hirshorn, Sydney; David K. Money, Pennant Hills; Stephen J. Swift, Hornsby, and Robert J. Evans, Chatswood, all of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Feb. 23, 1981, Ser. No. 237,089
Int. Cl.³ D61N 1/20
U.S. Cl. 128—419 F 23 Claims



1. A monitorable implantable bone growth stimulator comprising an hermetically-sealed metal container and at least one electrode lead exiting therefrom; said container having therein

a power source, circuit means powered by said power source for delivering a constant direct current over said electrode lead to a bone to be stimulated, a transmit-only coil, and means for generating current pulses through said coil at a rate dependent upon the magnitude of said constant direct current for radiating a monitorable signal externally of said container, said circuit means including a current reference and means for delivering a current which is proportional to and dependent upon said current reference, said current pulse generating means operating at a rate which is likewise proportional to and dependent upon said current reference.

4,414,980

BLOOD FLOW MONITOR APPARATUS

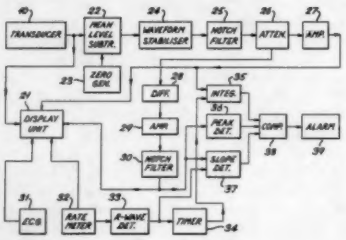
Godfrey T. Mott, Ruislip, England, assignor to National Research Development Corporation, London, England

Filed May 27, 1981, Ser. No. 267,606

Claims priority, application United Kingdom, May 29, 1980, 8017845

Int. Cl.³ A61B 5/02

U.S. Cl. 128—664 **8 Claims**



1. A blood flow monitor apparatus comprising a transducer having a face for application to the skin, a photoelectric detector, first light guide means extending between said detector and said face, a light source, second light guide means extending between said source and said face to terminate in an array surrounding said first light guide means, means for providing a first signal representing the rate of change with time of the output from said detector, and means for providing a second signal representing the ratio between the maximum and minimum values of said first signal.

4,414,981

ELECTROCARDIOGRAPH COMPUTER DISPLAY SYSTEM

Alan S. Wong, Escondido; Mitchell S. Karwan, Santa Ana, and Keith L. Germane, Costa Mesa, all of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Continuation of Ser. No. 192,600, Sep. 30, 1980, abandoned. This application Apr. 21, 1982, Ser. No. 370,332

Int. Cl.³ A61B 5/04

U.S. Cl. 128—712 **30 Claims**

1. A method in a display system for a high-speed viewing of extended ECG recordings on a CRT, comprising the steps of:

scanning the recording at a predetermined speed,

writing a video ECG signal into an addressable memory,

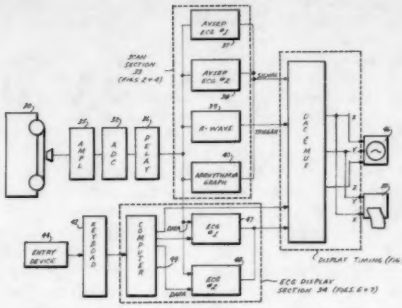
detecting the R wave of ECG events and forming a pulse train thereof,

writing said R wave pulse train into an addressable memory,

generating an R-to-R signal train, storing said R-to-R signal train into an addressable memory,

reading and displaying intervals of said ECG video signal stored in said memory from addresses representing a few cycles of ECG signal, triggered by reading the corresponding R pulse train at a set of addresses offset sufficiently from said ECG interval such that each entire ECG complex is displayed in an AVSEP mode,

continuously updating said memories as said recording is scanned while simultaneously reading and displaying an



arrhythmiagraph corresponding to a larger segment of ECG signals based on said R-R signal memory.

4,414,982

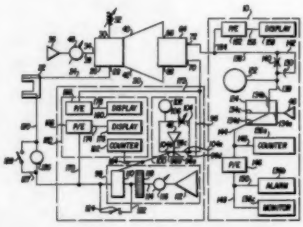
APNEIC EVENT DETECTOR AND METHOD

Gerald Durkan, Altoona, Pa., assignor to Tritec Industries, Inc., Wethersfield, Conn.

Filed Nov. 26, 1980, Ser. No. 210,653

Int. Cl.³ A61B 5/08

U.S. Cl. 128—716 **14 Claims**



1. A method of detecting apneic events comprising the steps of:

sensing pressure in an in vivo respiratory system, negative pressure in said respiratory system being created by an attempt to inspire and nonnegative pressure in said system being indicative of noninspiration;

generating a first fluid signal whenever nonnegative pressure occurs in said in vivo respiratory system, said first fluid signal having a duration related to the duration of said nonnegative pressure;

applying said first fluid signal to an elastic capacitance device, said elastic device having a pre-determined maximum capacity for storing a volume of fluid substantially equal to a volume of fluid created by the continuous application of said first fluid signal for a predetermined time period;

discharging said elastic capacitance whenever negative pressure occurs in said in vivo respiratory system and,

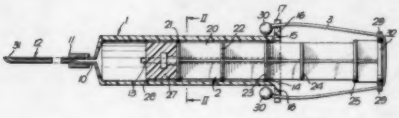
activating a signaling means to indicate an apneic event whenever the pressure created in said elastic capacitance device by the continuous application of said first fluid signal for a time greater than the pre-determined time period exceeds the maximum capacity of the elastic capacitance device.

4,414,983

MEDICO-SURGICAL INSTRUMENTS

John M. Evans, Oxford, and Keith Gilroy, Ashford, both of England, assignors to John M. Evans and Smiths Industries Public Limited Company, both of London, England

Filed Aug. 19, 1981, Ser. No. 294,126
Claims priority, application United Kingdom, Sep. 12, 1980, 8029617
Int. Cl.³ A61B 5/00
U.S. Cl. 128—747 7 Claims



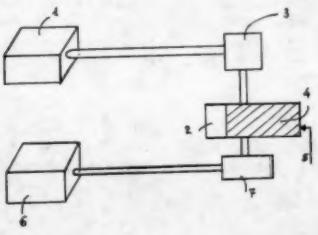
1. A medico-surgical instrument for inserting a hollow-bored needle into a body space, the instrument comprising: a barrel member; a needle having a bore therethrough; means mounting said needle on said barrel member; a plunger, said plunger being located for movement within said barrel member, the barrel member and the forward end of said plunger together defining a cavity of variable volume that opens into the bore of said needle; passage means in said barrel member, said passage means being spaced from the end of the barrel member proximate said needle, said plunger being movable between positions in which the forward end of the plunger is located rearwardly of said passage means so as to permit the flow of air from the outside of said instrument into said cavity, and in which the forward end of the plunger is located forwardly of said passage means such as to prevent the flow of air between the outside of said instrument and said cavity; and resilient means, said resilient means urging said plunger and said barrel member together so as to cause said plunger to move toward said needle to reduce the volume of said cavity and thereby force air from said cavity through said bore when said needle penetrates a body space, said plunger extending outwardly of the rearward end of said barrel member so that the movement of said plunger is visible from outside of said instrument so as to provide an indication of penetration of the body space by said needle.

4,414,984

METHODS AND APPARATUS FOR RECORDING AND OR REPRODUCING TACTILE SENSATIONS

Alain Zarudiansky, 22 rue Exelmans, 78140 Velizy, France

Filed Dec. 14, 1978, Ser. No. 969,295
Claims priority, application France, Dec. 19, 1977, 77 38181
Int. Cl.³ A61B 5/10
U.S. Cl. 128—774 5 Claims



1. A method of providing to a human subject tactile sensation simulating the tactile exploration of an object, comprising the steps of:

recording on a suitable support a first sequence of signals corresponding to spatial and temporal parameters, representative of a sequence of tactile exploration of a plurality of points of said object;

recording on a suitable support a second sequence of signals provided by sensing means operative to sensing, at least one parameter representative of tactile sensation given by each of said plurality of points of said object, said sensing means being operatively moved in contact with said object, so as to reproduce spatially and temporally, the above mentioned sequence of tactile exploration;

applying simultaneously to a part of the body of said human subject, transducer means respectively operative

to impart movement to said part of the body in response to said recorded first sequence of signals

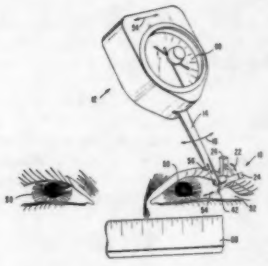
to exert tactile stimuli to said part of the body in response to said recorded second sequence of signals.

4,414,985

OPHTHALMIC CLIP

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 137,682, Apr. 7, 1980. This application Jun. 7, 1982, Ser. No. 385,356
Int. Cl.³ A61B 5/10
U.S. Cl. 128—782 5 Claims



1. A method for measuring torque on an eyeball to correct a strabismus condition, comprising the steps of:

displacing the eyeball in a single plane by means gripping the eyeball's sclera to exert a force on the eyeball sufficient to correct the condition while isolating any forces outside the single plane from being exerted on the eyeball; and

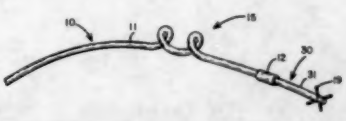
simultaneously with said displacing step, measuring the force exerted on the eyeball.

4,414,986

BIOMEDICAL STIMULATION LEAD

Eugene A. Dickhudt, and Roger A. Paulson, both of New Brighton, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 29, 1982, Ser. No. 344,124
Int. Cl.³ A61N 1/04
U.S. Cl. 128—785 10 Claims



1. A biomedical stimulation lead for insertion in an epidural space comprising:

a lead body, having a distal end and a proximal end, including a conductor and an external casing made of pliable material generally inert to body fluids, the casing enclosing the conductor;

attachment means mounted adjacent the distal end of the lead body for attaching by fibrosis within the epidural space;

an exposed electrode mounted on the lead body spaced proximally away from the attachment means for stimulating within the epidural space, the electrode being conductively connected to the conductor; and

wherein the lead body is formed in a helix at a location proximally spaced from the electrode, the helix being generally coaxial with the lead body for bearing outward to hold the lead body within its position in the epidural space and for absorbing intermittent longitudinal pressure on the lead body in a proximal direction.

4,414,987

PROCESS FOR INCREASING THE FILLING POWER OF TOBACCO LAMINA FILLER

Francis V. Utsch, Midlothian; Roger Z. de la Burde, Powhatan; Patrick E. Aument, and Henry B. Merritt, both of Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,814
Int. Cl.³ A24B *3/18*
U.S. Cl. 131—296 **10 Claims**

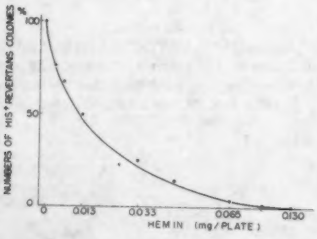
1. A single step process for increasing the filling power of tobacco lamina filler comprising contacting tobacco lamina filler with a heat transfer medium such that heat is rapidly and substantially uniformly transferred from the medium to the filler for a total contact time sufficient to stiffen and expand said filler, said filler being free of exogenous impregnants immediately before being contacted with said medium, having an OV value, immediately before being contacted with said medium, within the range of from about 8% to about 30%, and having an OV value, immediately after being contacted with said medium, of less than about 5%.

4,414,988

TOBACCO SMOKE FILTER

Michiko Yagi, Tokyo, Japan, assignor to Kabushiki Kaisha Advance Kaihatsu Kenkyujo, Nihonbashi, Japan

Filed Aug. 21, 1981, Ser. No. 294,991
Claims priority, application Japan, Aug. 23, 1980, 55-116144
Int. Cl.³ A24D *3/00, 3/14, 3/16*
U.S. Cl. 131—334 **10 Claims**



1. A tobacco smoke filter comprising an aqueous solution of at least one compound having a metallic ion binding protoporphyrin ring structure as a removal agent of carcinogenic substances from tobacco smoke, and a porous carrier or container therefore, said compound in the aqueous solution being present at a concentration ranging from 0.1 to 20 mM, said concentration being sufficient for effectively removing said carcinogenic substances from the tobacco smoke.

4,414,989

IMPACT FILTER FOR TIPPED CIGARETTES

Miguel S. Moragrega, Diagonal 523, 11°, F (Atalaya), Barcelona, Spain

Filed Sep. 29, 1981, Ser. No. 306,814
Int. Cl.³ A24D *1/04, 3/04*
U.S. Cl. 131—339 **1 Claim**

1. An impact filter for tipped cigarettes, characterized in that it comprises a cylindrical chamber, of somewhat hard and transparent material, the diameter whereof is equal to that of the cigarette, which has coupled thereto a lower base with a series of very small peripheral orifices, their diameters being oriented perpendicularly to the flow of smoke, in order to impart greater velocity to the smoke which passes through them on being inhaled by the smoker and therefore make it impinge with greater force against the inner surface of an upper base of the mentioned chamber, which chamber is not very high in relation to its diameter, so that the mentioned impingement is as intense as possible and the smoke is thus rejected by the impact and directed against the inner surface of the aforementioned lower base, a large portion of the tar contained in the cigarette smoke thus being deposited on both of said bases, the smoke then ascending again, as a result of the suction to which it is subjected, to emerge from the chamber through a downward tubular orifice provided in the centre of the upper base thereof, the chamber being located between two portions of conventional absorbent material, the chamber and portions being connected by a likewise conventional wrapping, so that the specified unit presents the aspect of the filters usually incorporated by tipped cigarettes.

4,414,990

FLUORIDATED DENTAL ARTICLES

Kevin G. Yost, Short Hills, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Apr. 2, 1982, Ser. No. 364,716
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—91 **15 Claims**

1. A fluoridated dental article comprising: a plurality of filaments of a substrate material formed into a thread having a diameter which permits insertion between the teeth; a wax coating substantially covering said thread and; a polymeric coating including a fluoride salt substantially covering said wax coating.

4,414,991

APPARATUS FOR USE IN CUTTING HAIR

Bernadine A. Marcotte, 10515 Prouty Rd., Painesville, Ohio 44077

Filed Sep. 16, 1982, Ser. No. 418,754
Int. Cl.³ A45D *24/36*
U.S. Cl. 132—45 R **9 Claims**

1. An apparatus for use in cutting hair to a nonlinear pattern in which the length of the hair varies, said apparatus comprising first and second panels, each of said panels having major sides extending between a first edge portion and a nonlinear pattern edge portion, said pattern edge portion on each of said panels including surface means for guiding a device to cut hair

along a nonlinear path, said pattern edge portion on said first and second panels having the same configuration with crests projecting outwardly away from the first edge portions and troughs between the crests, said surface means on each of said panels being disposed along the outer edges of said crests and troughs to guide cutting of the hair at the crests and troughs with the hair cutting device, and connector means interconnecting said first and second panels for enabling said panels to move between an open condition in which the major sides of said panels are spaced apart so that hair can be positioned between said panels and a closed condition in which a first major side of said first panel is disposed in a side-by-side rela-

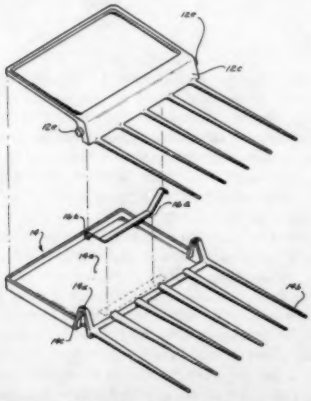
tionship with a first major side of said second panel with hair between the first major sides of said first and second panels, said crests of the pattern edge portion on said first panel being aligned with said crests of the pattern edge portion on said second panel and said troughs of the pattern edge portion on said first panel being aligned with said troughs of the pattern edge portion on said second panel when said panels are in the closed condition to enable said surface means to guide the hair cutting device to cut the hair disposed between the major sides of said first and second panels along a nonlinear path extending along the crests and troughs of the pattern edge portions on said first and second panels.

4,414,992

HAIR FLUFFING DEVICE

Joseph W. Russell, 9465 Hobart Ave., Los Angeles, Calif. 90047

Filed Mar. 29, 1982, Ser. No. 351,194
Int. Cl.³ A45D *24/06*
U.S. Cl. 132—129 **4 Claims**



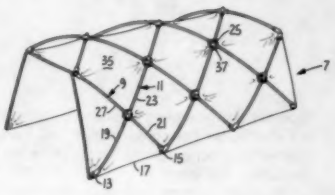
1. A hair fluffing device, insertable in the hair, comprising:
(a) a first comb including a holding part with teeth extending therefrom, wherein said teeth all lie in a single plane;
(b) a second comb including a holding part with teeth extending therefrom and lying substantially in a single plane, wherein said second comb is pivotally interconnected with said first comb such that in the normal, unstressed condition the lengths of the teeth of said first comb substantially occupy the space formed along and between the lengths of the teeth of said second comb;
(c) resilient means mounted between the holding parts of said first and second combs causing the teeth of each of said combs to separate when pressure is exerted on said holding parts of said combs.

4,414,993

FLEXIBLE VAULT STRUCTURE HAVING MULTIPLE PIECE POLES

Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003

Continuation-in-part of Ser. No. 290,661, Aug. 6, 1981, abandoned. This application Oct. 29, 1981, Ser. No. 316,089
The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.
Int. Cl.³ A45F *1/16*
U.S. Cl. 135—104 **4 Claims**



1. A vault structure having an arcuate shape in cross section and a generally rectangular shape in plan, said vault structure extending from a plane and having no member from side-to-side in said plane comprising in combination:
a. a plurality of rod-like members,
b. each of such rod-like members being held in tension by stress means and thereby formed into a generally arcuate shape, and a plurality of said rod-like members extending from the level of the plane on one side, over the top of the arcuate structure to the level of the plane on the opposite side,
c. said stress means comprising a flexible member attached to said rod-like members at a plurality of points,
d. said stress means forming a plurality of geometric cords with respect to said arcuate rod-like members and,
e. at least some of said rod-like members consisting of short members having connectors for connecting said short members in end to end relationship.

4,414,994

EARTHQUAKE FIRE SAFETY SYSTEM

Roderick D. Hogan, 22487 Fuller Ave., Hayward, Calif. 94541

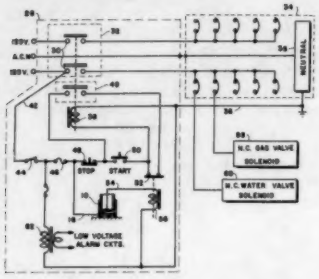
Filed Nov. 18, 1981, Ser. No. 322,522
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—38 **7 Claims**

1. A safety system for instantaneously switching off electricity upon occurrence of a shock of predetermined magnitude, said system including:
a power distribution box having an input terminal and a plurality of electric output terminals;
an electrical power contactor connected into the electrical path between input power terminals of the safety system and said distribution box input terminals, the contacts of said contactor being closed by current flow through a first electrical winding and being opened by current flow through a second electrical winding; and
an adjustable shock-sensitive switch coupled between one of said input power terminals and said second electrical winding, said shock-sensitive switch comprising:
a vertical tubular non-conductive housing having a first electrical conductor overlying the internal floor

thereof, said conductor being a first electrical terminal of said switch;

an electrically conductive fluid within said non-conductive housing, said fluid overlying said first electrical conductor;

a core member vertically slidable within the bore of said housing, said core member having an electrically con-



ductive floor providing a second electrical terminal of said switch, the bottom surface of said electrically conductive floor being spaced from the top surface of said conductive fluid; and

means coupled between said core member and said housing for clamping said member and said housing against relative vertical movement.

4,414,995

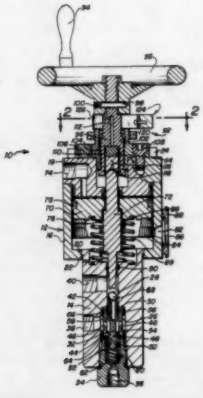
THREE-WAY HYDRAULIC CONTROLLER

Larry K. Spencer, 1204 Tappan Cir., Carrollton, Tex. 75006

Filed Apr. 8, 1982, Ser. No. 366,605

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—77 **12 Claims**



4. A three-way control valve comprising:

a body having a supply port, a valve port, an exhaust port and a pilot port for receiving a pilot pressure therein;

valve element means disposed in said body for movement between a position to block fluid flow through the supply port while permitting fluid communication between the valve and exhaust ports and a position to permit fluid communication between the supply and valve ports while blocking fluid flow through the exhaust port;

means disposed in said body for urging said valve element means to the position with fluid flow through the supply port being blocked while permitting fluid communication between the second and third ports;

means disposed within said body for acting against said urging means to move said valve element means to the position with the supply port being in fluid communication with the valve port while blocking fluid flow through the exhaust port in response to pilot pressure; and

override means connected to said body for overriding said urging means to place the supply port in fluid communication with the valve port, said override means including heat responsive means for permitting said urging means to move said valve element means to prevent fluid communication between the supply and valve ports whenever said controller is subjected to elevated temperatures even though said override means is positioned to place the supply port in fluid communication with the valve port.

4,414,996

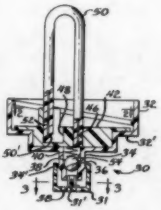
SYSTEM FOR AUTOMATICALLY DISPENSING LIQUID CHEMICALS INTO AN INTERMITTENTLY FLOWING LIQUID STREAM

Peter P. Klepa, Los Angeles, Calif., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 13, 1981, Ser. No. 310,018

Int. Cl.³ G05D *11/02*

U.S. Cl. 137—101.27 **7 Claims**

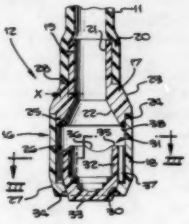


1. An apparatus for dispensing a liquid chemical into an intermittently flowing liquid stream contained in a feeder chamber housing having an inlet opening for receiving said liquid stream and an outlet opening in the form of a siphon tube which is positioned within the chamber so as to intermittently empty substantially all of the liquid in the chamber when the level of the liquid reaches a predetermined maximum elevation, said apparatus comprising mounting means for mounting an inverted container of a liquid chemial on an upper surface of the feeder chamber housing; valve means on said container having an actuating portion extending into said feeder chamber; means mounted in said feeder chamber for actuating said actuating portion of said valve means in response to the liquid in said feeder chamber reaching, or at least closely approaching, said predetermined maximum elevation; said valve means having a metering chamber sized to contain substantially the quantity of liquid chemical which is to be dispensed upon each actuation of the actuating portion; said metering chamber being selectively sealed at its lower end by a sealing means which is controlled by said actuating portion; said metering chamber having its upper end in communication with the liquid in said inverted container by means of an inverted U-shaped capillary siphon tube, said capillary siphon tube serving to slowly fill said metering chamber following each actuation of the actuating portion to empty the chamber.

4,414,997
SIPHON

Jeff A. Jacobson, 22 Woodgrove, Irvine, Calif. 92714, and Louis G. Valle, 7283 Pennway, Stanton, Calif. 90680

Filed Jun. 27, 1980, Ser. No. 163,708
Int. Cl.³ F04F *10/00*
U.S. Cl. 137—151 2 Claims



1. In a self-contained portable siphon having a flexible tubing and a valve, said valve having a freely movable valve element therein, said valve comprising a valve body having a throughbore with a valve seat in the bottom wall thereof, said valve element having a bottom wall substantially conforming to said valve seat to provide a generally fluid tight seal between said element and said seat, the improvement which comprises:

said valve seat having tapered walls;

said valve element being loosely disposed in said valve and consisting of a generally cup-shaped body having a throughbore closed off by an imperforate bottom wall integral with an imperforate peripheral side wall tapered similarly to the tapered walls of said valve seat and spacing means including a plurality of spaced fins extending along the outer wall of said cup-shaped body in a direction generally parallel to the longitudinal axis thereof spacing said cup-shaped body away from the inner wall of said valve body thereby forming a cup-shaped cavity on said element adapted to hold fluid therein whereby fluid entering said valve body enters the cavity in said element and weighs down said element into said valve seat pressing the tapered side wall of said element against the tapered wall of said valve seat to provide said seal;

stop means on the inner wall of said valve body for stopping upward movement of said valve element including an inner flange in said valve body surrounding said throughbore for stopping upward movement of said valve element and wherein said element includes an upper peripheral wall and the outer diameter of the wall of said element is substantially as large as the area of said throughbore at said inner flange whereby said element abuts against the inner flange when it moves upwardly thereagainst; and

a plurality of spaced arcuate-shaped cut-out areas in said element about the periphery of the upper wall thereof providing fluid flow past said element through said cut-out areas and into said tubing.

4,414,998
AIR GAP SYSTEM TO MAINTAIN PURE LIQUID SUPPLIES

Helmut Rudler, York, and Ralph J. Williams, New Oxford, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Aug. 11, 1981, Ser. No. 291,893
Int. Cl.³ E03C *1/10*; F16K *24/00*; F16L *55/07*
U.S. Cl. 137—216 5 Claims

1. An air gap unit and system comprising in combination:

a. a housing,

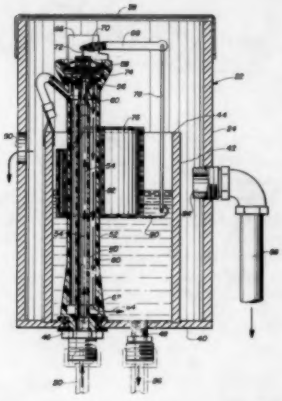
b. a reservoir in said housing of less area than said housing and extending upward from the bottom of the housing and terminating a predetermined distance from the top of said housing,

c. a coaxial pair of inner and outer tubes of different diameters nested in said housing and extending vertically from the bottom of said housing, the upper ends of said tubes extending a predetermined distance substantially above the top of said reservoir,

d. first conduit means extending from the lower end of said inner tube to a municipal fresh water supply,

e. second conduit means connectable to the bottom of said reservoir for delivery of fresh water from said reservoir to a mechanism requiring the same,

f. a flow control valve at the upper end of said coaxial tubes to control the flow of water from said top of the inner tube to the top of the outer tube,



g. the lower end of the outer tube having fresh water discharge opening means to permit the flow of fresh water therefrom into said reservoir,

h. a float operable vertically in said reservoir and connected to said valve for operation thereof to determine a normal level of fresh water in said reservoir,

i. said housing having in one sidewall thereof at a level substantially below the top of said reservoir an outlet to a drain to prevent accidentally filling the housing with water in the event of a malfunction of the system, and

j. an air gap opening in one wall of said housing at a level above that of said outlet in said housing but no higher than the top of said reservoir to permit overflow water from said reservoir to discharge from said housing in the event of a malfunction of said outlet.

4,414,999
CONTINUOUS FLUSHING DEVICE

Michael I. Basta, 503 N. Roosevelt Blvd. - Apt. A314, Falls Church, Va. 22044

Filed Dec. 12, 1980, Ser. No. 215,870
Int. Cl.³ F16K *51/00*
U.S. Cl. 137—240 18 Claims

1. A flow regulating assembly for providing a continuous regulated small-volume flow of medical fluid to a catheter system for monitoring hemodynamic functions and for providing an intermittent operator-controlled large-volume flushing flow of the fluid to the catheter system, said assembly comprising:

a housing;

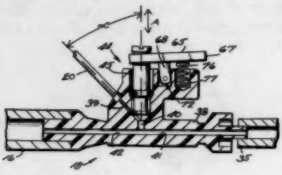
means defining a fluid inlet passage to said housing;

means defining a fluid outlet passage from said housing directly intersecting with said fluid inlet passage;

a fluid flow-occluding member;

means for mounting said fluid flow-occluding member in

said housing for movement from a first position wherein said flow-occluding member is generally at the intersection of said inlet and outlet passages and wherein fluid flow between said fluid inlet and fluid outlet passages is occluded, to a second position wherein said flow-occluding member is moved out of the path of fluid flow from said inlet passage to said outlet passage so that intersecting imaginary straight lines extending in said inlet passage and said outlet passage do not intersect any portion of said flow-occluding member so that said flow-occluding member introduces substantially no turbulence in a flushing flow of fluid from said inlet passage to said outlet passage which tkakes place with said flow-occluding member in said second position; and



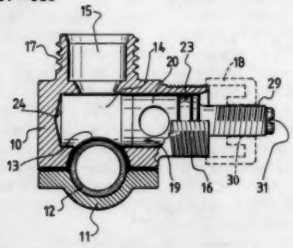
means defining a restricting passage in said flow-occluding member so that when said member is in said first position in a small-volume continuous regulated flow of fluid from said inlet passage through said occluding member to said outlet passage takes place even when said flow-occluding member is in said first position.

4,415,000

T-JOINT FITTING

Gert O. Ödmann, Askim, Sweden, assignor to Gotaverken Motor U.S. Inc., Southfield, Mich.

Filed May 17, 1982, Ser. No. 379,156
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—318 **3 Claims**



1. A T-joint fitting comprising a housing having a first part and a second part, cooperating recesses in said parts which when said parts are fitted together form a cavity to receive a portion of a transport pipe, aligned bores in said first and second parts to receive fastening bolts on each side of said transport pipe, fastening bolts in said bores for clamping said first and second housing parts together with said pipe therebetween,

an operating passage in said first housing part extending substantially transversely to the longitudinal axis of said transport pipe, an externally threaded portion on said first housing part extending colinearly with respect to said passage, a second passage communicating with said first passage and terminating in a portion of said first housing part adapted to receive a branch pipe,

a piston member slidably disposed within said operating passage, a transverse flow passage extending through said piston member, a cutting means on the end of said piston member facing said pipe for cutting through the wall of said transport pipe when said piston is moved inwardly,

a screw threaded bar on the opposite end of said piston member extending outwardly therefrom and coaxially with respect to said externally threaded portion,

a packing of elastomeric material of sufficient size to be clamped between said first and second housing parts at the bolts clamping said housing parts about said transport pipe and to cover that part of said transport pipe fitting into the part of said cavity located in said first housing part,

said packing having a waffle-textured surface on the side engaging said transport pipe, and an actuating

means comprising a nut having an internal screw thread cooperatively engaging said externally threaded portion of said first housing part and an internal screw threaded bore cooperatively engaging said screw threaded bar,

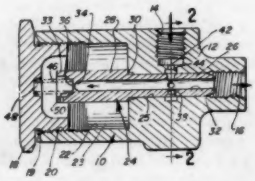
the screw threads of said bar and of said externally threaded portion having the same pitch, but being oppositely handed so that rotation of said nut onto said externally threaded portion displaces said piston member in said operating passage to cut through said packing and the wall of said transport pipe.

4,415,001

PRESSURE RISE RATE LIMITER VALVE

Preben Kent, Altadena, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 24, 1981, Ser. No. 257,225
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—497 **6 Claims**



1. A pressure rise rate limiter valve, comprising:

a housing having an elongate bore axially aligned with an enlarged opening defining a cavity in communication with said bore,

said housing having an axially extending outlet port communicating with said bore at the end of the bore opposite to said cavity, a radially extending inlet port in said housing between said cavity and said outlet port and communicating with said bore,

a valve spool slidably mounted in said bore and having an axially extending passageway communicating with said axially extending outlet port, an axially facing internal shoulder in the passageway at the end of the passageway remote from said outlet port, said shoulder having a restricted orifice formed therein in communication between said passageway and said cavity,

said spool having radially directed feeder ports located between said outlet port and said shoulder communicating with said axial passageway in said spool, said feeder ports being selectively alignable with said inlet port in said housing, and

resilient means for urging said spool into position to align the feeder ports with said inlet port, said resilient means being located in said cavity and bearing against the end of said spool containing said restricted orifice, whereby a sudden increase in pressure of a fluid connected to the inlet port or the outlet port causes the fluid to contact the shoulder surrounding the orifice in the passageway to move the spool axially against the resilient means to decrease or to cut off the fluid flow between the inlet port and the feeder

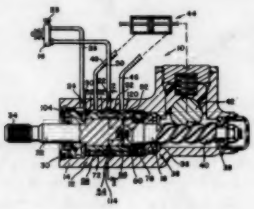
ports, said fluid in the passageway bleeds through the orifice into the cavity to increase the pressure in the cavity which pressure combines with the urging of said resilient means to gradually move the spool toward the original position as the fluid pressure in the cavity approaches an equilibrium with the fluid pressure in the passageway in the spool, wherein the feeder ports and inlet port will gradually realign until full fluid flow is directed through the passageway and through the outlet port.

4,415,002

HYDRAULIC CONTROL APPARATUS

Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 8, 1981, Ser. No. 271,295
Int. Cl.³ F15B *9/08*
U.S. Cl. 137—625.23 **14 Claims**



1. Hydraulic control apparatus comprising a rotatable sleeve member defining a bore receiving a relatively rotatable member, said members defining axially extending grooves, said grooves in registry cooperating to define an axially extending aperture, said aperture movably receiving an elongated pin coupling said members for rotation in unison, said pin and said members cooperating to define a pair of fluid flow paths adjacent said pin for communicating pressurized fluid through said apparatus, characterized by said sleeve member and said pin cooperating to define a pressure chamber, and passage means for communicating pressurized fluid from said pair of flow paths to said pressure chamber, the axially extending groove in said sleeve member includes radially extending walls which are substantially parallel, said elongated pin including a portion which is received in the axially extending groove in said sleeve member, said portion including surfaces which are substantially parallel.

4,415,003

CONTROL OF FLUID FLOW USING A FLEXIBLE DISC

Joseph R. Paradis, Holden, and Edward W. Kaleskas, Jefferson, both of Mass., assignors to Nypro Inc., Clinton, Mass.

Continuation-in-part of Ser. No. 235,668, Feb. 18, 1981, Pat. No. 4,369,812, which is a continuation-in-part of Ser. No. 50,823, Jun. 21, 1979, Pat. No. 4,286,628. This application Aug. 27, 1981, Ser. No. 297,057
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—843 **7 Claims**

1. A flow control device comprising:

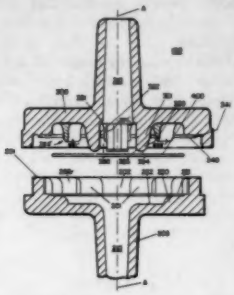
a housing;

a control channel in said housing extending to a flow channel;

a flexible disc on a valve seat in said control channel;

means for prebiasing said flexible disc comprising a set of prongs for engaging a central portion of said disc and being separated by passageways that extend to said flow channel; and

a segmented ring surrounding said flow channel to prevent said flexible disc from overflexing when said device is



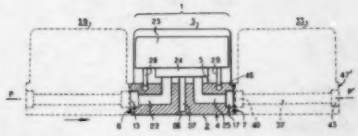
operated in its open position with flow into said control channel and outwardly through said flow channel.

4,415,004

PNEUMATIC SWITCH

Daniel Bouteille; Michel Nicholas; Eric Petrimaux, and Pierre Prudhomme, all of Nanterre, France, assignors to La Telemecanique Electrique, France

Filed Dec. 1, 1980, Ser. No. 211,964
Claims priority, application France, Nov. 30, 1979, 79 29820
Int. Cl.³ F15B *13/07*
U.S. Cl. 137—884 **8 Claims**



1. In the assembly of a switching unit (1) and a distributor unit (33), the distributor unit having a feed entry (40) and the switching unit having a body (2–3) which has first (4) and second (5) parallel faces and comprises:

(i) an entry (13) and an outlet (17) for fluid under pressure, an exhaust (27) and a control entry (18 or 19); (ii) a distributing means (23) adapted to couple this outlet (17) selectively to said entry (13) and to said exhaust (27), as a function of the absence or the presence of a control signal applied to said control entry (18 or 19), the said outlet (17) for fluid under pressure being in communication with the said feed entry (40) of the distributor unit (33); the improvement which consists in that:

(A) the distributor unit (33) has:

(a) first (46) and second (47') opposed parallel faces and first (50-50') and second (49-49=) coupling means on the said first (46) and second (47') parallel faces;

(b) at least first (37) and second (34) parallel channels each having a first orifice (40-44) on the first face (46) and a second orifice (43-47) on the second face (47'), said first and second channels passing through the said distributor unit, for circulation of a fluid under pressure and of an exhaust fluid respectively, the first orifice (40) of the first channel (37) constituting the said feed entry of the distributor unit;

(B) the body of the switching unit (1) has third (6) and fourth (7) parallel and opposed faces which are substantially at right angles to the first (4) and second (5) parallel faces of the said body and on which are respectively disposed the

said entry (13) and the said outlet for fluid under pressure (17) of the switching unit;

(C) a channel (30) for circulation of an exhaust fluid disposed in said body opens on the third and on the fourth face of the body through respective first (10) and second (14) exhaust orifices;

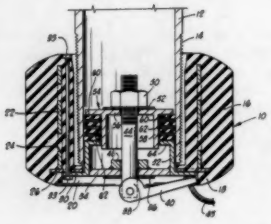
(D) further second coupling means (45-48) on the fourth face (7) of the said body, said further second coupling means being adapted to cooperate with the fi-st coupling means (50-50') of the distributor unit when the first face of the distributor unit is placed against the fourth face of the said body, the said outlet (17) of the switching unit being then coupled to the said first orifice (40) of the first channel and the said second exhaust orifice (14) of the switching unit being coupled to the said first orifice (44) of the second channel of the distributor unit.

4,415,005

PIPE THREAD PROTECTOR DEVICE

Harlo W. Janzen, Box 356, Fairview, Okla. 73737

Filed Jul. 27, 1981, Ser. No. 287,499
Int. Cl.³ F16L 57/00
U.S. Cl. 138—96 T 9 Claims



1. A device for protecting pipe threads comprising:

an annular elastomeric sleeve dimensioned to surround a pipe thread to be protected;

stop means connected to an end of said sleeve for limiting axial movement of the sleeve on a pipe; and

a radially expandable internal gripping subassembly carried on said stop means, and extending into said annular elastomeric sleeve from said end thereof for gripping the inner surface of a pipe upon which said thread protector device is mounted, said gripping subassembly comprising:

a pair of radially expandable, elastomeric gripping elements each constituting a compression disc, and each having a convexly curved surface facing the other of said elastomeric gripping elements;

a rigid compression plate having said elastomeric gripping elements disposed on opposite sides thereof with the convexly curved surfaces of the gripping elements in contact with said compression plate, said rigid compression plate having a central aperture therethrough;

a compression shaft extending through the center of said radially expandable elastomeric gripping elements and through the central aperture in said rigid compression plates;

means adjacent an end portion of the compression shaft for transmitting axial movement from the compression shaft to said gripping elements; and

manually operable camming arm means connected to the compression shaft and operative to cam the compression shaft into axial movement upon actuation of the camming arm means;

a pair of guide posts each having one end secured to said stop means and projecting in an axial direction therefrom through said compression discs and said compression plate;

a pair of spacer tubes around said guide posts and each having an end bearing against said stop means; and

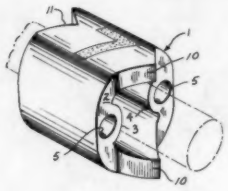
a back-up plate bearing against the ends of said spacer tubes opposite their ends which bear against said stop means, and flatly abutting the one of said compression discs closest to said stop means.

4,415,006

MARKER SLEEVES

Joseph C. Barbieri, Cedarburg, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Dec. 26, 1978, Ser. No. 972,934
Int. Cl.³ F16L 11/12
U.S. Cl. 138—115 6 Claims



1. In a marker sleeve of slightly elastic material of the type comprising an outer wall defining a tubular body which is to be positioned about an article and a plurality of inner webs each secured at its ends to the outer wall and extending longitudinally along the interior of the tubular body for engagement with an article to which the marker sleeve is applied,

the improvement wherein:

(a) the plurality of inner webs are equally spaced from one another about the interior of the tubular body,

(b) each inner web is separated from its respective overlying portion of the outer wall by a longitudinally extending aperture of circular, oval, rectangular or triangular cross section, and

(c)the inner webs have an initial position wherein they extend radially inwardly of the tubular body and a second position assumed upon engagement with an article in which they straighten relative to their initial position and stretch their respective overlying portion of the outer wall to provide for firm engagement of the sleeve with an article to which it is applied.

4,415,007

APPARATUS FOR EFFECTING BACK-AND-FORTH MOVEMENT OF A GUIDE SYNCHRONOUSLY WITH THE INTERMITTENT ROTARY MOVEMENT OF A SHAFT

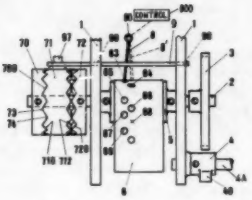
Walter Kleiner, Hirzel-Zuerich, Switzerland, assignor to Staeubli Ltd., Horgen-Zuerich, Switzerland

Filed Aug. 11, 1981, Ser. No. 292,106
Claims priority, application Switzerland, Aug. 18, 1980, 6203/80
Int. Cl.³ D03C 1/24, 1/22, 3/34
U.S. Cl. 139—329 8 Claims

1. In an apparatus which includes a rotatably driven shaft, a member supported for movement in a direction which is approximately parallel to said shaft, and means for effecting back-and-forth movement of said member in synchronism with rotational movement of said shaft, the improvement comprising first and second spaced outer disks fixedly supported on said shaft and a central disk axially slidably supported on said shaft and fixed against rotation therewith, said member being secured to said central disk, said first and second disks each having on an axially inwardly facing surface thereof an annular tooth system which is concentric to said shaft, and said central disk having on each of two axially facing surfaces thereof an

annular tooth system which is concentric to said shaft, the angular spacing between adjacent teeth of each said tooth system being a common, predetermined value, said tooth systems on said outer disks being angularly aligned and said tooth systems on said central disk being angularly offset with respect to each other by half said predetermined value.

8. A dobby for controlling a weaving machine, comprising a rotatably driven shaft; a drive cylinder fixedly and coaxially supported on said shaft for rotation therewith; a pattern card extending over and operatively driven by rotation of said drive cylinder, said pattern card having axially spaced first and second rows of control points extending therealong substantially in the direction of movement thereof and having perforations at a plurality of said control points; an elongate guide member spaced from and extending substantially parallel to said shaft and drive cylinder, having an opening therethrough, and supported for movement in a direction generally parallel to said drive cylinder and shaft between first and second positions; a reading needle supported for lengthwise movement



toward and away from said pattern card approximately normal thereto, the end of said reading needle nearest said pattern card extending slidably through said opening in said guide member; said end of said reading needle being aligned axially with said first and second rows of control points when said guide member is respectively in said first and second positions; means defining first and second annular, axially spaced tooth systems which are coaxial with and fixed against rotation relative to said shaft and which each include a plurality of angularly spaced teeth, means defining a first tooth and a second tooth on said guide member which are respectively engageable with teeth of said first and second tooth systems when said guide member is in said first and second positions, engagement of said first tooth with a tooth of said first tooth system in response to rotation of said shaft and tooth systems causing said guide member to be moved from said first position to said second position, and engagement of said second tooth with a tooth of said second tooth system in response to rotation of said shaft and tooth systems causing said guide member to be moved from said second position to said first position.

4,415,008

DEVICE FOR MONITORING THE WEFT THREAD TRAVEL ON AN AIR JET WEAVING MACHINE

Hans-Peter Keller, Oberdürnten, and Max Bossard, Dürnten, both of Switzerland, assignors to Loepfe Brothers Limited, Wetzikon, Switzerland

Filed Sep. 14, 1981, Ser. No. 301,652

Claims priority, application Switzerland, Oct. 14, 1980, 7648/80

Int. Cl.³ D03D *51/34*

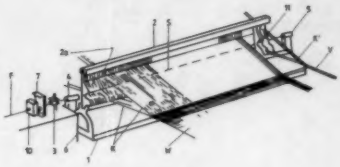
U.S. Cl. 139—370.2 **6 Claims**

1. In a device for monitoring the weft thread travel on an air jet weaving machine which is provided with a lathe beam and a reed fixed thereon, an air jet for inserting the weft thread, and weft thread receiving means comprising suction means, said device comprising an optoelectrical weft thread sensor including a measuring area and arranged at the reed such that the measuring area is crossed by the path of the weft thread travel, the improvement which comprises:

a tactile weft thread travel sensor arranged at the machine upstream of the air jet;

a start pulse generator controlled by the weaving machine;

the optoelectrical sensor being located near the end of the reed adjacent the weft receiving means; and



electronic circuitry controlled by said start pulse generator and optoelectrical sensor for producing an activating signal defining the time interval during which the weft thread travel is monitored.

4,415,009

WEFT INSERTING DEVICE FOR PNEUMATIC WEAVING LOOMS

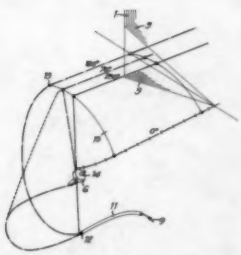
Henry A. Shaw, Ieper, Belgium, assignor to N. V. Weefautomaten Picanol, Belgium

Filed Oct. 15, 1981, Ser. No. 311,643

Claims priority, application Belgium, Oct. 15, 1980, 58806

Int. Cl.³ D03D *47/29, 47/34*

U.S. Cl. 139—435 **5 Claims**



1. Weft inserting device for pneumatic weaving looms, of the type comprising a yarn pulling off mechanism, a first air jet nozzle next to an edge of he warp, and a clamp which is located between these two last named components, this clamp being cyclically controlled to clamp the yarn at the end of the insertion of a weft until the beginning of the insertion of the next weft, characterized in that the mutual geometrical positions of the yarn pulling off mechanism and of the clamp are selected in relation to the position of the first air jet nozzle so that the yarn completely leaves the clamp whilst the latter is open.

4,415,010

RETRACTOR APPARATUS FOR A WEFT-INSERTING PROJECTILE IN A WEAVING MACHINE

Gerd Schmitz, Sulz, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 20, 1981, Ser. No. 313,175

Claims priority, application Switzerland, Oct. 24, 1980, 7930/80

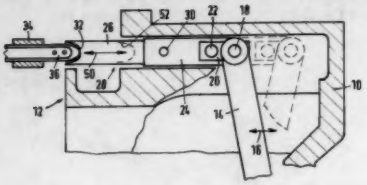
Int. Cl.³ D03D *47/24*

U.S. Cl. 139—439 **9 Claims**

1. In a weaving machine, the combination comprising

a retractor having a stop surface for abutting a weft-inserting projectile;

a retractor lever connected to said retractor for moving said retractor; and



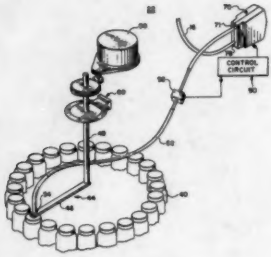
at least one elastically yielding and damping body of annular shape between said stop surface and said lever, said body having an elasticity at least three times greater than that of steel.

4,415,011

SAMPLE COLLECTOR

Douglas M. Grant, Lincoln, Nebr., assignor to ISCO, Inc., Lincoln, Nebr.

Filed Nov. 2, 1981, Ser. No. 316,979
Int. Cl.³ B65B *3/04*; B67C *3/28*
U.S. Cl. 141—284 **10 Claims**



1. A sample collector for transferring liquid from a body of liquid to plurality of containers comprising:

a conduit means having a flow passage, an inlet port and an outlet port;

said inlet port being adapted to be inserted in a body of liquid;

means for positioning said outlet port sequentially over certain of said plurality of containers, whereby samples of said liquid may be inserted into said containers;

pump means operatively coupled to said conduit means for selectively pumping liquid through said flow passage between said inlet port and said outlet port for insertion into said different ones of said plurality of containers;

control means coupled to said pump means for controlling the pumping operation thereof;

detection means operatively coupled to said conduit means at a predetermined position between said pump means and said outlet port for detecting the presence of a liquid interface within said conduit means at said position and providing a signal representative thereof; and

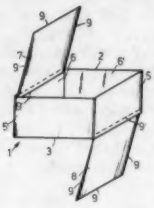
said control means including means for controlling the volume of liquid pumped through said conduit means by said pump means from the time said interface signal is received, whereby a predetermined volume of liquid is applied to said selected container.

4,415,012

RUCKSACK ASSEMBLY

Herbert Böse, Am Dachsbau 9, Bad Soden, Neuenhain, Fed. Rep. of Germany (D - 6239)

Filed Sep. 24, 1981, Ser. No. 305,150
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036258
Int. Cl.³ A45F *3/08*; B65D *30/22, 33/16*
U.S. Cl. 150—51 **3 Claims**



1. A rucksack assembly comprised of a plurality of superposed box-shaped sections of textile fabric consisting of four side walls each having an upper edge and a lower edge, a top cover hingedly attached to one of the upper edges of one of the side walls and a bottom cover hingedly attached to one of the lower edges of one of the side walls, the covers having three free edges for connection to, and separation from, corresponding ones of upper and lower free edges of the side walls; and two-piece fastening elements between the corresponding free edges of the covers and the side walls, the fastening element pieces being connectable to, and separable from, each other, one of the corresponding free edges carrying one piece of a respective one of the fastening elements and the other one of the corresponding free edges carrying the other piece of the respective fastening element whereby the free edges of the side walls may be selectively connected to the free edges of the covers or the free edges of the side walls of an adjacent one of the superposed sections.

4,415,013

REPAIR FOR THE TIRE SEPARATIONS

Fred B. Vine, Britt Township, St. Louis County, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 28, 1982, Ser. No. 383,380
Int. Cl.³ B60C *21/02, 21/00*
U.S. Cl. 152—367 **6 Claims**

1. A method for repairing tires which have experienced the separation of exterior rubber from the tire carcass in the shoulder and/or face area of the tire which comprises:

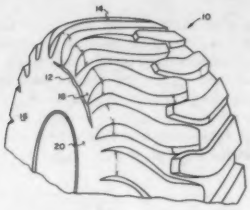
(a) removing any rubber separated from the tire carcass down to the depth of said separation;

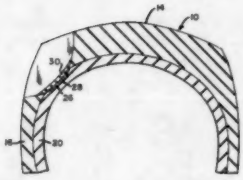
(b) buffing the area of the tire carcass exposed by said removal to a smooth finish;

(c) applying a rubber adhesive means to the buffed area;

(d) covering said buffed area with a blanket of uncured rubber the thickness of which blanket is between one-fourth (¼) and one and one-half (1½) inches and substantially less than the thickness of the rubber removed from the tire carcass, so as to prevent a substantial differential in flexure between said blanket and said tire carcass and to prevent excessive heat

buildup between said blanket and said tire carcass when said tire is in operation;





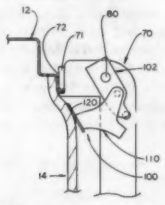
(e) stitching said blanket to the tire carcass; and,
(f) curing the said blanket to the tire carcass.

4,415,014

BEAD BREAKING TOOL

Eugene W. Turpin, 66 N. Academy, Sanger, Calif. 93657

Filed Apr. 20, 1981, Ser. No. 255,522
Int. Cl.³ B60C *25/06*
U.S. Cl. 157—1.28 **10 Claims**



1. A bead breaking tool for mounting releasably on a wheel rim which has a pair of annular, axially spaced flanges and is provided with a tire having a pair of beads disposed between the flanges and individually engaged therewith, the tool comprising:

A. a pair of shoes individually fitted to the flanges outwardly of the beads;

B. A frame extended between the shoes and secured individually thereto to retain the shoes in a disposition wherein each shoe engages the corresponding flange oppositely of the beads, the frame being shaped to span the tire outwardly of the rim when the shoes are engaged with the flanges;

C. a blade insertable between one of the flanges and the one of the beads engaged therewith;

D. means mounted on the one of the shoes engaged with the one flange for guiding the blade in a first path generally radially of the rim between the one flange and the one bead to insert the blade therebetween;

E. means mounted on the one shoe for guiding the blade in a second path generally axially of the rim with the blade inserted between the one flange and the one bead; and

F. means for urging the blade along the second path away from the one flange and pushing the one bead axially from said flange to break engagement therebetween, said means for urging the blade along the second path being mounted on the one shoe and transferring thereto a reaction force from said pushing; and

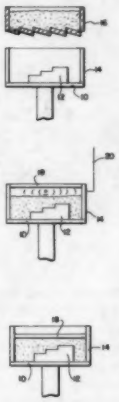
G. means for releasably clamping the one shoe to the one flange and for transferring the force from the shoe to the flanges so that force is not exerted on the frame.

4,415,015

PROCESS OF COMPACTING MOULDING SAND

Lumir Zadera, Flurlingen, Switzerland, assignor to George Fischer, Ltd., Switzerland

PCT No. PCT/CH80/00008, § 371 Date Oct. 2, 1980, § 102(e) Date Oct. 1, 1980, PCT Pub. No. WO80/01544, PCT Pub. Date Aug. 7, 1980
PCT Filed Jan. 24, 1980, Ser. No. 207,959
Claims priority, application Switzerland, Feb. 2, 1979, 1037/79
Int. Cl.³ B22C *15/00*
U.S. Cl. 164—37 **5 Claims**



1. A process for compacting moulding sand to form a casting mould, comprising the steps of:

filling a moulding space located between a pattern plate and a pressure plate with moulding sand;

pre-compacting the moulding sand, after the moulding space is filled with moulding sand and closed by the pressure plate, by an explosive-type shock pressure; and subsequently

re-compacting the moulding sand by mechanically pressing the moulding sand between the pattern plate and the pressure plate.

4,415,016

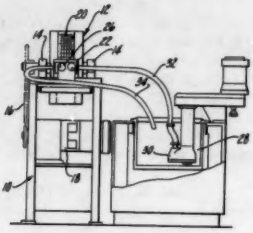
MACHINE FOR CONTINUOUSLY CASTING BATTERY GRIDS

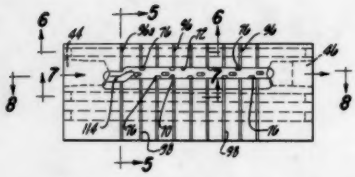
Jack E. McLane; Raymond L. Schenk; Robert R. Rader, and John W. Wirtz, all of Port Huron, Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Filed May 20, 1982, Ser. No. 380,056
Int. Cl.³ B22D *11/10*
U.S. Cl. 164—429 **11 Claims**

1. In a machine for continuously casting battery grids, the machine including a drum adapted to be rotated in one direction and having on its outer peripheral surface a cavity which defines the pattern of the battery grid, said grid pattern com-

prising two sets of intersecting grooves, the grooves in one set extending circumferentially of the drum and being spaced axially apart and the grooves in the other set extending axially of the drum and being spaced apart circumferentially, said grooves defining pads therebetween which form the outer peripheral surface of the drum and which define the open spaces between the wires of the cast battery grid, said machine including a shoe having an arcuate surface in mating engagement with said pads around an arcuate segment of the drum, said shoe having an orifice slot therein which is axially coextensive with said cavity and which is open at a portion of said arcuate surface that is intermediate the circumferentially





opposite ends of the shoe, said shoe having an inlet and an outlet communicating with axially spaced portions of the orifice slot, said machine also including means for directing molten lead at superatmospheric pressure to said inlet in an amount in excess of that required to progressively fill the grid cavity as it rotates past the opening in the orifice slot so that the excess is discharged through said outlet, that improvement which comprises means on said shoe on the upstream side of said orifice slot and registering with the circumferentially extending grooves on the drum for blocking the flow of molten lead through said circumferential grooves in a direction upstream from the orifice slot.

4,415,017

CONTROL OF LIQUID-SOLID INTERFACE IN ELECTROMAGNETIC CASTING

John C. Yarwood, Madison; Gary L. Ungarean, Woodbridge, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 26, 1981, Ser. No. 277,759
Int. Cl.³ B22D 11/16, 11/00
U.S. Cl. 164—453 **8 Claims**

1. In a process for casting materials, comprising the steps of:

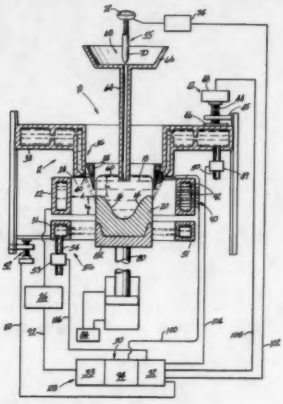
electromagnetically containing and forming molten material during a casting run into a casting of desired shape, delivering molten material at a set flow rate into the containment zone whereby a desired height of molten material is established, said casting including during said casting run a liquid-solid interface defined by molten material head and solid material portions of said casting;

providing an inductor for applying a magnetic field to said molten material, said magnetic field defining a containment zone for said molten material, applying an alternating current to said inductor to generate said magnetic field, and applying coolant to said casting for solidifying the molten material, the improvement comprising the steps of:

automatically maintaining the location of the liquid-solid interface at a desired set point in said containment zone, said location maintaining step comprising the steps of:

continuously sensing the location of said liquid-solid interface along the periphery of said casting;

responsive to said sensing step in a first mode of operation when the liquid-solid interface varies from said desired set point less than a desired percentage of the length of the



inductor, controlling said coolant while maintaining the flow rate of molten material into the containment zone substantially constant in a manner to keep the location of the liquid-solid interface substantially constant; and

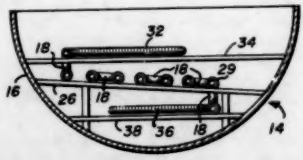
responsive to said sensing step in a second mode of operation when the liquid-solid interface varies from said desired set point more than said desired percentage, changing the flow rate of molten material delivered to the containment zone and adjusting the coolant in a manner so as to return the location of the liquid-solid interface to said desired set point, and responsive to said liquid-solid interface returning to said desired set point, cycling back to the first mode of operation.

4,415,018

HEAT TRANSFER APPARATUS FOR TRANSPORTABLE LIQUID CONTAINERS

Leonard S. Rosenberger, Saratoga, Calif., assignor to Kaydee Engineering, Inc., Saratoga, Calif.

Filed Jun. 1, 1981, Ser. No. 269,386
Int. Cl.³ F28F 9/00
U.S. Cl. 165—41 **9 Claims**



1. An apparatus for providing heat transfer to the contents of the mobile tank comprising:

an inlet port;

a flexible inlet loop attached at one terminal end to the inlet port;

a continuous pipe means attached to the second terminal end of the inlet loop, said continuous pipe means including a planar array of a plurality of parallel open loops extending within the tank along the tank's axis of motion;

a flexible outlet loop, having a first terminal end attached to the opposite end of the continuous pipe means and having a second terminal end attached to an outlet port;

a support structure, rigidly engaged with the tank and slidably engaged with the pipe means; and

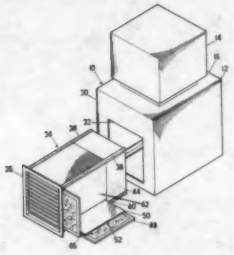
shock absorbing means engaged with the continuous pipe means.

4,415,019

HEAT EXCHANGE VENTILATING UNIT

Dean L. Hunzicker, Madison, Wis., assignor to Hunzicker-Riley, Inc., Verona, Wis.

Filed Apr. 12, 1982, Ser. No. 367,477
Int. Cl.³ F28F 9/00
U.S. Cl. 165—47 **10 Claims**



1. A combined ventilating and heat exchanging unit for a building comprising:

a heat exchange housing (12) having an open bottom, an intake portal (32) on one side thereof, and an exit portal (18) on the top thereof, the heat exchange housing (12) adapted to being mounted on the roof of a building with the open bottom opening into the interior of the building;

a ventilator fan (14) received on the top of the heat exchange housing (12) to draw air out from the exit portal (18) and exhaust it to the atmosphere;

air handling and conditioning means connected to the bottom of the heat exchange housing (12) for conducting stale air to be exhausted to the housing (12) and to convey fresh air from the housing into the interior of the building; and

a heat exchange assembly (34) capable of conducting a heat exchange between air passing from the air handling means through to the exit portal (18) and air passing from the intake portal (32) through to the air handling means; the heat exchange assembly (34) sized and shaped so that it can slide into and out of the heat exchange housing (12) through the intake portal (32) so that the heat exchange assembly (34) can easily be serviced from the roof of the building.

4,415,020

VESSEL CONSTRUCTION EMPLOYING MULTIPLE INTERNAL HEAT EXCHANGE TUBES

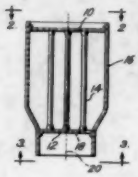
Paul G. Daugirda, Evergreen Park, Ill., assignor to Rheem Manufacturing Company, New York, N.Y.

Division of Ser. No. 116,272, Jan. 28, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,447
Int. Cl.³ F28F 9/16
U.S. Cl. 165—76 **3 Claims**

1. An improved vessel in a water heater tank construction, the improvement comprising, in combination:

a plurality of open heat exchange tubes having terminal ends;

first and second opposed headers including opposed openings for receipt of the tubes; means for affixing the tubes in sealed relationship with the header and for retention thereof in generally parallel sealed array, each end of a tube being metallurgically affixed to one of the headers, said headers having an identical configuration and a separate uniform constant transverse dimension, the first one of said headers defining a uniform constant transverse dimension smaller that the transverse dimension of the second header, said assembled tubes and headers being coated with a protective material to define a header subassembly; and



a tank body having a uniform cross sectional interior shape along the length of the body, said cross sectional shape identical to the shape of the headers for slidable and adjustable receipt of the headers, said body having two transverse dimension regions, one of said regions having a uniform constant transverse dimension to slidably receive the first header and the other region having a different uniform constant transverse dimension to slidably receive the second header, said first header being slidably positioned within the one region and metallurgically affixed to the body in the one region and the second header being slidably positioned within the second region and metallurgically affixed to the body in the second region.

4,415,021

POSITIONING A THIN WALL ROUND WRAPPER WITHIN A HEAVY WALL OUT-OF-ROUND SHELL OF A HEAT EXCHANGER

John R. Bayless; Homer G. Hargrove, and Edwin G. Thompson, all of St. Petersburg, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1981, Ser. No. 293,725
Int. Cl.³ F28F 7/00
U.S. Cl. 165—76 **10 Claims**

1. A heat exchanger comprising a tubesheet with a plurality of holes for receiving tubes;

a heavy wall rolled cylindrical shell portion attached to the tubesheet;

a thin wall round wrapper portion disposed within said shell portion and spaced therefrom;

a plurality of generally parallel tube support plates longitudinally spaced within said wrapper portion and having a plurality of holes for receiving tubes;

jacking members disposed circumferentially about said wrapper portion adjacent the location of said support plates, said jacking members extending radially outwardly from said wrapper portion into engagement with said shell portion;

a first array of lugs affixed to said shell portion;

a first array of blocks affixed to said wrapper;

said first array of lugs and blocks being cooperatively associated to prevent longitudinal movement of said wrapper portion with respect to said shell portion adjacent said first array of lugs;

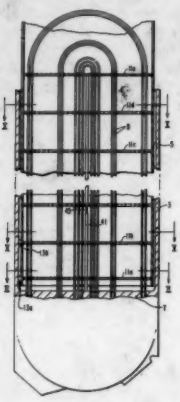
a second array of lugs affixed to said shell;

a second array of blocks affixed to said wrapper;

said second array of lugs and blocks being cooperatively associated to prevent relative rotation of said shell portion

with respect to said wrapper portion adjacent said second array of lugs;

wedges disposed between said wrapper portion and said tube support plates; and



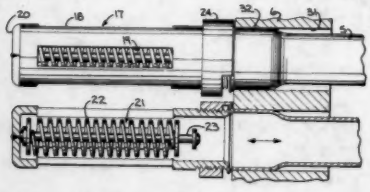
means for preventing rotation of said tube support plate with respect to said wrapper, whereby said holes in said tube support sheets can be aligned with said holes in said tubesheet and the support plate can be accurately spaced within the wrapper portion to provide a controlled annular space therebetween.

4,415,022

MOUNTING FOR HEAT EXCHANGER TUBE CLEANER CAPTURING DEVICES

Walter J. Baron, and Laird C. Cleaver, both of Milwaukee, Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Filed Feb. 18, 1982, Ser. No. 350,288
Int. Cl.³ F28G 1/12
U.S. Cl. 165—95 **4 Claims**



1. A heat exchanger comprising:

(a) a housing,

(b) a plurality of longitudinally extending fluid flow tubes disposed within said housing,

(c) tube sheets disposed within said housing and with said tube sheets having openings receiving said tubes,

(d) longitudinally extending cages disposed in communication with said tubes for receiving shuttling tube cleaning elements,

(e) the end portions of said tubes extending longitudinally outwardly of said tube sheets,

(f) and means for quick releasably mounting said cages to said tube end portions outwardly of said tube sheets, said mounting means including:

(1) an arcuate undercut seat disposed on the inner end of a respective cage,

(2) and a flared lip on the outer end portion of a respective adjacent tube,

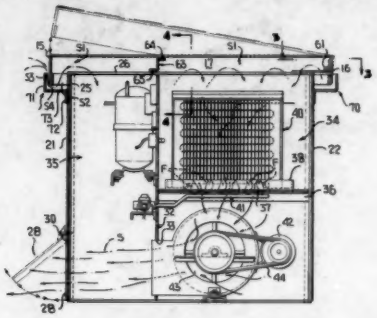
(3) said seat and lip engaging to releasably hang said cage from said tube.

4,415,023

HEAT EXCHANGER HOUSING WITH AIR DEFLECTING BAFFLE AND HINGE DOOR

Gerry Vandervaart, Niagara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Filed Jun. 3, 1981, Ser. No. 269,947
Int. Cl.³ F24H 3/06, 9/02; F28F 13/06
U.S. Cl. 165—122 **28 Claims**



1. A housing for a heat exchanger comprising a generally upstanding peripheral wall having an upper peripheral end portion terminating in an upper peripheral terminal edge, a cover over said upper peripheral end portion, said cover being defined by an end wall and a depending peripheral skirt, said upper peripheral terminal edge being spaced from said end wall and defining therebetween a first space, said peripheral skirt and upper peripheral end portion being in relatively spaced telescopic relationship and defining therebetween a second space in communication with said first space whereby air can flow through said spaces from the exterior to the interior of said housing, further means disposed contiguous said upper peripheral end portion and said terminal edge for restricting the flow of air into said housing through said spaces about substantially the entire peripheral-extent thereof, and means for generating an open flame in said housing whereby the restricted air flow within said housing reduces the possibility of the open flame being blown out by high air movement exteriorly of said housing.

4,415,024

HEAT EXCHANGER ASSEMBLY

Robert L. Baker, Amherst, N.Y., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 5, 1980, Ser. No. 204,321
Int. Cl.³ F28D 7/00
U.S. Cl. 165—160 **19 Claims**

1. A heat exchanger assembly comprising

an elongated shell having a fluid inlet and a fluid outlet,

an elongated bundle assembly received within said shell,

said bundle assembly having a plurality of elongated tubes extending generally longitudinally within said bundle assembly and a plurality of generally parallel fin plates oriented generally transversely with respect to said elongated tubes,

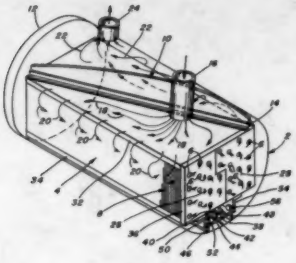
said bundle assembly having a top sheet and a bottom sheet,

bundle assembly support means interposed between said bottom sheet and said elongated shell,

baffle means interposed between said top sheet and said elongated shell, said baffle means separating said fluid inlet and said fluid outlet, and

said baffle means including an elongated baffle plate extend-

ing longitudinally generally diagonally on said bundle assembly between said fluid inlet and said fluid outlet,



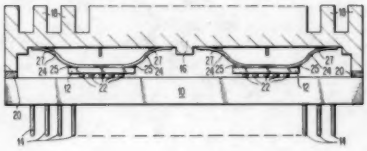
whereby said baffle plate directs said fluid through the full longitudinal extent of said bundle.

4,415,025

THERMAL CONDUCTION ELEMENT FOR SEMICONDUCTOR DEVICES

Joseph L. Horvath, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,218
Int. Cl.³ H01L *23/36*
U.S. Cl. 165—185 **15 Claims**



1. In a semiconductor package having a substrate, at least one semiconductor device mounted on said substrate, and a cold plate located over and in close proximity to the device, the improvement comprising

a thermal bridge element for conducting heat from said device to said cold plate, said thermal bridge element comprising

a bulged disk of resilient heat conductive material,

a first plurality of spaced radial slots emanating from a central opening and terminating short of the outside edge,

a second plurality of spaced radial slots located between said first plurality of radial slots in alternating relation extending inwardly from the outside edge, and terminating short of the center of said disk.

4,415,026

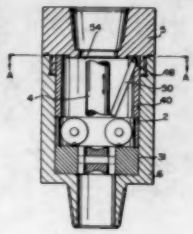
ROLLER GUIDE FOR OIL-WELL PUMP

Joe Rezewski, Box 1199, and Wayne Bernes, Box 1387, both of Drayton Valley, Alberta, Canada

Filed Jan. 22, 1981, Ser. No. 227,316
Claims priority, application Canada, Jan. 23, 1980, 344271
Int. Cl.³ E21B *33/03*
U.S. Cl. 166—97 **5 Claims**

1. A guide for guiding a pump-rod in a well-head consisting of:

a housing capable of being neld between a wellhead tee and a stuffing box comprising an enclosure having two pairs of transversely rotatable rollers positioned substantially at right angles to each other, each pair of transverse rollers being held in a separate cage, each having a pair of parallel pins upon which the rollers are rotatably mounted and one cage being located above the other and being located relative to the other by a dowel between the mating faces



of the cages, each roller of each pair being off-set from the center line of the pump-rod such that the pump-rod will pass between both sets of rollers to be guided, during operation, in a reciprocating path.

4,415,027

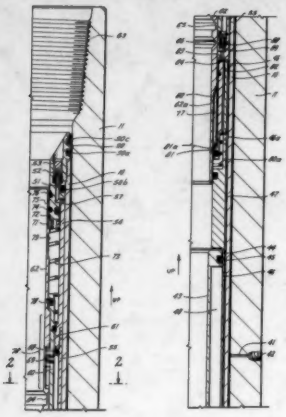
ACCUMULATOR RECHARGING VALVE

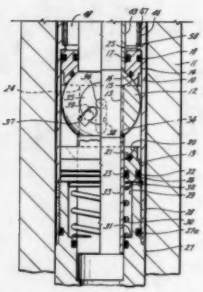
Larry R. Russell, 6025 Edgemoor, Suite C, Houston, Tex. 77081

Filed Jun. 16, 1982, Ser. No. 389,072
Int. Cl.³ E21B *34/10, 43/00*
U.S. Cl. 166—113 **18 Claims**

1. Accumulator recharging valve for use in charging a pressure accumulator of a well tool while the well tool is incorporated in a pipe string downhole in a well, comprising a tubular housing disposed within a tubular tool body, a tubular sleeve spaced annularly inward of said tubular housing to form an annular space therebetween, said tubular sleeve having a circular annular gap in its upper portion providing flow communication between the pipe string interior and said annular space when open, control valve means for controllably closing and opening said circular gap, said annular space being divided by partition means at an intermediate point of its axial length into a lower annular accumulator space and an upper annular flow communication space, said gap communicating with said flow communication space, said partition means including bleed valve means for providing flow communication from said accumulator space to said pipe string interior when said control valve means is fully opened, charging valve means for permitting pressured fluid flow from said flow communication space to said accumulator space when the fluid pressure in said flow communication space exceeds the fluid pressure in said accumulator space, cam means for controlling movement of said control valve means whereby said control valve means may be fully opened to cause opening of said bleed valve means and bleeding off of pressure within said accumulator

space, and may be partially opened to provide recharging of said accumulator space from said pipe string interior through





said flow communication space and said charging valve means while said bleed valve means is closed.

4,415,028

APPARATUS FOR MEASURING BOTTOM HOLE WELL CONDITIONS

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Sep. 8, 1981, Ser. No. 300,087

Claims priority, application United Kingdom, Dec. 18, 1980, 8040474

Int. Cl.³ E21B *23/00, 34/06*

U.S. Cl. 166—206 **3 Claims**

1. An apparatus for use in the tubing of a well for shutting off flow through the tubing comprising,

an isolation valve having a bore with an annular seat in the bore,

side ports leading into the bore below said annular seat,

a valve element longitudinally movable in the valve between an open position below said ports and a closed position seated on the seat,

said valve including means for supporting a measuring instrument below said valve,

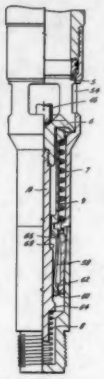
said valve element having an elongate mandrel having a backup shoulder,

a longitudinally movable latch mechanism for initially holding the valve element in the open position including,

a longitudinally movable collet initially engaging the mandrel and holding the valve element in the open position,

said collet engaging and held in a latched open position by the backup shoulder,

means initially holding the backup shoulder against the collet,



spring means urging the valve element to the closed position when the backup shoulder is longitudinally moved out of engagement with the collet.

4,415,029

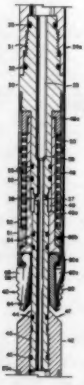
DOWNHOLE WELL TOOL AND ANCHORING ASSEMBLY

Donna K. Pratt, and Jamie B. Terrell, both of Fort Worth, Tex., assignors to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Jul. 23, 1981, Ser. No. 286,146

Int. Cl.³ E21B *23/04, 29/02*

U.S. Cl. 166—212 **18 Claims**



1. In a downhole chemical cutting tool having a chemical section adapted to contain a chemical cutting agent and a cutting section in fluid communication with said chemical section and having cutting ports for the discharge of chemical cutting agent, said tool adapted to be insertd into a wellbore and anchored at a downhole location thereof, the combination comprising:

(a) an elongated slip shaft extending longitudinally of said tool;

(b) a slip array comprising a plurality of slip segments having serrated outside gripping surfaces slidably disposed on the

peripheral surface of said slip shaft and pivotally mounted at one end to slip actuation means;

(c) slip expansion mandrel means secured to said shaft at a location between said cutting ports and said slip array and having a tapered surface adapted to receive said slip segments to expand said array in a deployed position upon the movement of said array in the direction of said mandrel means.

(d) means biasing said slip segments inwardly about said slip shaft as said slip array is withdrawn from a deployed position and moved away from said mandrel means to a retracted position, said biasing means comprising cantilever springs secured to a structural member of said tool behind said slip array and projecting forwardly into engagement with said slip segments to bias said slip segments inwardly as said slip array is withdrawn from said deployed position to the retracted position; and

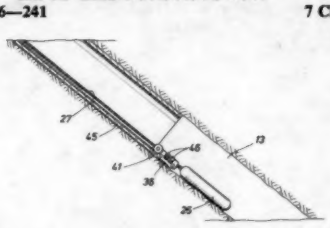
(e) said slip array being arranged in the retracted position to provide a spacing between adjacent slip segments with the maximum distance between adjacent slip segments occurring between the gripping surfaces of adjacent slip segments.

4,415,030

CASING RE-ENTRY APPARATUS FOR USE IN INCLINED OIL AND GAS BOREHOLES

Arnold M. Walkow, and Eugene J. Linyaev, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 9, 1981, Ser. No. 232,607
Int. Cl.³ E21B *17/10, 31/00, 47/00*
U.S. Cl. 166—241 **7 Claims**



1. Apparatus for traversing a deviated borehole, comprising:
a well logging cable;
an elongated logging instrument attached to said cable; and
a casing re-entry assistor mounted on said cable at a location immediately above said logging instrument, said re-entry assistor formed by two conjugate body halves with a pair of wheels rotatably mounted thereon.

4,415,031

USE OF RECYCLED COMBUSTION GAS DURING TERMINATION OF AN IN-SITU COMBUSTION OIL RECOVERY METHOD

William C. Hunt, III, Farmers Branch, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,367
Int. Cl.³ E21B *43/243*
U.S. Cl. 166—261 **34 Claims**

1. In a method for the recovery of viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and at least one spaced-apart production well, said injection well and said production well in fluid communication with said formation, comprising:

(a) injecting into the formation via said injection well a mixture of oxygen and an inert gas having a predetermined low oxygen concentration to initiate an in-situ combustion operation adjacent said injection well resulting in the formation of a combustion front in the oil-containing formation and production of a combustion gas predominantly containing carbon dioxide;

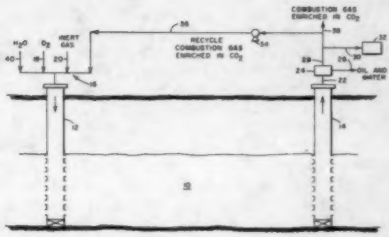
(b) continuing the injection of said mixture of oxygen and an inert gas for a predetermined period of time to advance the combustion front toward said production well;

(c) recovering fluids including oil and the combustion gas enriched in carbon dioxide from the formation via said production well;

(d) separating said oil from said combustion gas enriched in carbon dioxide;

(e) increasing the oxygen concentration of said injected gaseous mixture to a predetermined level and continuing injection of said gas for a predetermined period of time;

(f) injecting a mixture of oxygen and said combustion gas enriched in carbon dioxide recovered from the formation having a predetermined oxygen concentration and continuing injection of said mixture for a predetermined period of time;



(g) maintaining the oxygen concentration of said injected mixture of oxygen and combustion gas at a predetermined level so that the concentration of oxygen in the combustion gas is maintained at a predetermined value low enough to avoid the danger of an explosion or burning of the production well;

(h) terminating injection of oxygen when the oxygen concentration of the injected gas is reduced to a predetermined value and continuing to inject combustion gas until the combustion front is discontinued; and

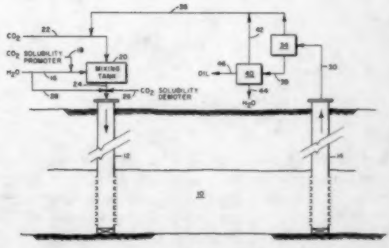
(i) continuing to recover fluids including oil from the formation via said production well.

4,415,032

CARBONATED WATERFLOODING FOR VISCOUS OIL RECOVERY USING A CO_2 SOLUBILITY PROMOTER AND DEMOTER

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,370
Int. Cl.³ E21B *43/20, 43/22*
U.S. Cl. 166—273 **8 Claims**



1. A method for the recovery of viscous oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and at least one spaced-apart production well, said injection well and said production well in fluid

communication with a substantial portion of the formation, comprising:

(a) injecting into the formation via said injection well a predetermined amount of a fluid comprising water containing a CO_2 solubility promoter and saturated at the injection pressure with carbon dioxide;

(b) injecting a predetermined amount of an aqueous solution of a CO_2 solubility demoter into the formation via said injection well;

(c) injecting a driving fluid comprising water into the formation via said injection well; and

(d) recovering fluids including oil from the formation via said production well.

4,415,033

INVERSE VISCOSITY GRADING

Albert F. Chan, and Jerry F. Casteel, both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Sep. 14, 1981, Ser. No. 301,490

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—274 **6 Claims**

1. A method of fluid flooding to increase oil recovery from a subterranean oil-bearing formation penetrated by an injection well and a production well, comprising grading the viscosity of all injected fluids in the fluid flood from a given viscosity at the initiation of the fluid flood to a higher viscosity at the end of the fluid flood to prevent the formation of viscous zones within the injected fluids.

4,415,034

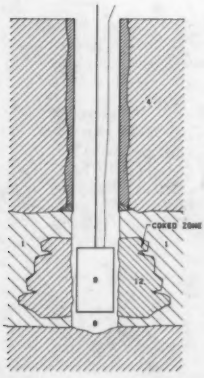
ELECTRODE WELL COMPLETION

Larry S. Bouck, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed May 3, 1982, Ser. No. 374,581

Int. Cl.³ E21B *36/04, 43/24*

U.S. Cl. 166—302 **7 Claims**



AT THE END OF THE COKE-PRODUCING PROCESS

1. A process for creating an effective electrode of enlarged radius, said electrode being a carbonaceous, current-carrying deposit in a subterranean, hydrocarbon-bearing formation surrounding the electrode, having the serial steps of:

(a) forming a borehole in the hydrocarbon-bearing formation,

(b) placing a heating device in said borehole,

(c) energizing the device to heat the surrounding formation to a temperature high enough to produce coking of at least a portion of the hydrocarbon-bearing formation, and

(d) maintaining the temperature of step (c) for a length of time to obtain the current-carrying electrode of desired radius.

6. A carbonaceous, current-carrying electrode, formed in a subterranean, hydrocarbon-bearing formation by the steps of:

(a) forming a borehole in the hydrocarbon-bearing formation,

(b) placing a heating device in said borehole,

(c) energizing the device to heat the surrounding formation to a temperature high enough to produce coking of at least a portion of the hydrocarbon-bearing formation, and

(d) maintaining the temperature of step (c) for a length of time to obtain the desired electrode radius.

4,415,035

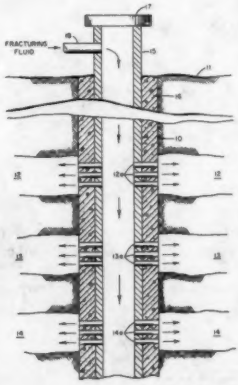
METHOD FOR FRACTURING A PLURALITY OF SUBTERRANEAN FORMATIONS

William L. Medlin, Dallas; Malcolm K. Strubhar, Irving, and John L. Fitch, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,398

Int. Cl.³ E21B *43/26*

U.S. Cl. 166—308 **4 Claims**



1. A method for forming fractures in a plurality of vertically disposed hydrocarbon-bearing formations communicating with a well equipped with a casing penetrating a subterranean earth formation, comprising the stes of:

(a) identifying those hydrocarbon-bearing formations penetrated by said well casing that exhibited at least a predetermined minimum pressure increase during previous individual fracturing treatments in other nearby production wells in the area,

(b) forming perforations in said well casing at the locations of said identified hydrocarbon-bearing formations, and

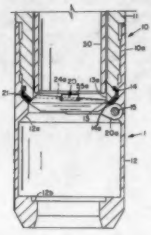
(c) applying hydraulic pressure through said perforations to said plurality of hydrocarbon-bearing formations simultaneously, whereby each of said identified hydrocarbon-bearing formations is fractured in proportion to the pressure increase in each of said hydrocarbon-bearing formations during the application of said hydraulic pressure.

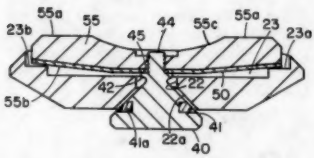
4,415,036

PRESSURE EQUALIZING FLAPPER TYPE SAFETY VALVE FOR SUBTERRANEAN WELLS

Michael A. Carmody, Broken Arrow, and Michael L. Cognevich, Tulsa, both of Okla., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 22, 1982, Ser. No. 350,670
Int. Cl.³ E21B *34/14*
U.S. Cl. 166—324 **15 Claims**





1. A flapper type safety valve for a subterranean well comprising, in combination, a tubular conduit, means on said tubular conduit defining a downwardly facing, annular valve seat, a flapper valve having an annular surface cooperable with said valve seat in sealing relation, pivot means on one side of said tubular conduit for mounting said flapper valve to said conduit to permit downward pivotal movement of said flapper valve away from said valve seat to a vertical position, resilient means urging said flapper valve to its closed sealing position, a valve actuating sleeve disposed in said tubular conduit, means for moving said actuating sleeve downwardly to engage and open said flapper valve, said flapper valve having a bypass aperture therethrough defining a downwardly facing annular sealing surface, a sealing plug insertable in said bypass aperture from the bottom, whereby well fluid pressure below said flapper valve urges said plug into sealing engagement with said downwardly facing sealing surface, means including a leaf spring diametrically traversing said flapper valve for biasing said sealing plug upwardly into sealing engagement with said downwardly facing annular sealing surface to maintain said bypass aperture closed, upstanding means on said sealing plug projecting upwardly through said bypass aperture, and abutment means secured to said upstanding means and projecting into the path of downward movement of said actuating sleeve, whereby initial downward movement of said actuating sleeve shifts said sealing plug downwardly to open said bypass aperture.

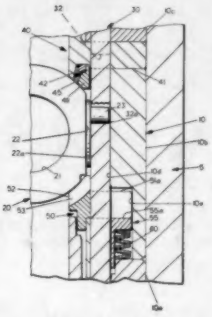
4,415,037

BALL VALVE LOADING APPARATUS

Robert T. Brooks, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Aug. 7, 1981, Ser. No. 290,742
Int. Cl.³ E21B *34/06*
U.S. Cl. 166—331 **3 Claims**

1. Apparatus for selectively opening and closing a subterranean fluid conduit in a well by rotation of a ball between two 90° displaced positions, said apparatus comprising: a hollow cylindrical housing; an annular seal support secured transversely within said housing by at least a pair of opposed radial ribs; annular sealing means mounted on the radially inner portions of said annular seal support; a pair of ball camming sleeve segments axially slidably mounted within the bore of said housing and passing through the annular segment spaces defined between said radial ribs; a ball valve having a cylindrical fluid passage therethrough and a spherical segment surface cooperating with said annular seal in sealing relation; opposed pins projecting from said ball and offset from the ball center; cam slots in said ball camming sleeve segments respectively receiving said pins, whereby axial movement of said camming



sleeve segments rotates said ball 90° between an open and a closed position relative to the bore of said annular seal; an annular loading element engaging the ball surface portion diametrically opposite to the portion engaged by said annular seal, said housing defining an annular interior recess adjacent said annular ball loading element, said loading element having at least two radially projecting ribs extending between said camming sleeve segments and into said housing annular recess; and a compressed spring in said recess transmitting a substantially constant axial force to said loading element, thereby producing a substantially constant loading force between said ball and said annular seal.

4,415,038

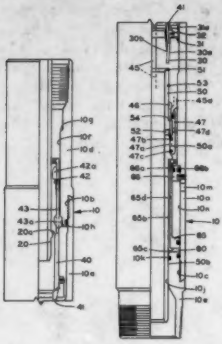
FORMATION PROTECTION VALVE APPARATUS AND METHOD

Phillip W. Schmuck, Spring, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jul. 10, 1981, Ser. No. 282,295
Int. Cl.³ E21B *34/14*
U.S. Cl. 166—373 **26 Claims**

1. A repeatedly operative valve for positioning in a conduit of a subterranean well, comprising: a tubular housing; an annular valve seat secured within said housing; a shiftable valve element cooperable with said annular valve seat to open or close the bore thereof, said valve element being resiliently urgable to a bore closing position; and actuator sleeve mounted in said tubular housing for vertical movements relative thereto and being operatively associated with said valve element; and means on said actuator sleeve engageable with an inserted tubing string for limited axial co-movement therewith during both insertion and retraction movements of said inserted tubing string, the resulting limited movement of said actuator sleeve in one direction producing movement of said valve element to a bore opening position and the resulting limited movement of said actuator sleeve in the opposite direction permitting said valve element to move to the bore closing position said actuator sleeve being provided with extension arms passing downwardly through the outer portions of said annular valve seat, and pressure equalizing valve means connected to the lower portions of said extension arms, said pressure equalizing valve means being exposed on one side to fluid pressure within the

conduit below said annular valve seat on the other side to the fluid pressure above said annular valve seat, said pressure equalizing valve means being closed by the initial movement of



said actuator in one direction and opened by the initial movement of said actuator in the other direction, thereby equalizing pressure on said valve element prior to opening thereof.

4,415,039

SOIL CULTIVATING IMPLEMENTS

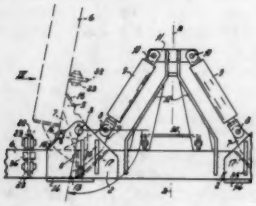
Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.W., Maasland, Netherlands

Filed Mar. 3, 1981, Ser. No. 239,973

Claims priority, application Netherlands, Mar. 3, 1980, 8001263

Int. Cl.³ A01B *23/04, 33/06, 59/043*

U.S. Cl. 172—47 **9 Claims**



1. A rotary harrow implement comprising frame means for mounting a transverse row of at least one group of power-driven soil working members mounted along the length of elongated portions of said frame means, a forward transverse carrier interconnected to said elongated portions to support said frame means, said carrier comprising a central part having connecting means attachable to the lifting device of a prime mover and a pair of spaced cheek plates at each end thereof, said central part having a width not substantially greater than that of said prime mover, a respective lateral arm connected to each pair of cheek plates by a pivot pin that defines a substantially horizontal axis and said lateral arm being interconnected to a respective said elongated frame portion so as to be tiltable with that portion upwardly about said pivot pin to an inoperative transport position and reduce the overall width of the implement, the inner end of said lateral arm being hinged to said cheek plates adjacent the upper sides thereof by said pivot pin and said inner end being fitted between said plates in the implement's working position, a displacing arm interconnecting said inner arm end to one end of a corresponding hydraulic piston and cylinder assembly and a pivotal connection between said displacing arm and said hydraulic assembly, said pivotal connection being located at substantially the same horizontal level as said pivot pin and inboard thereof when said lateral arm is in working position, said pivotal connection being displaceable by said assembly from a first location substantially the same level and inboard of said pivot pin to a second location substantially vertically beneath said pivot pin when said lateral arm together with respective frame portion is pivoted about the axis of rotation of said pivot pin and raised in its transport position, said connecting means comprising an upwardly extending triangular trestle that mounts a said hydraulic piston and cylinder assembly at opposite sides thereof, each said assembly extending substantially parallel to a respective upwardly inclined side of said trestle, the lower end of each said assembly being extendable to displace said pivotal connection with respect to said pivot pin from said first location to said second location when said lateral arm is raised to its transport position.

4,415,040

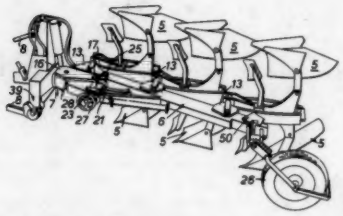
FULLY MOUNTED VARIABLE WIDTH PLOW

Henri E. Salva, Croix, France, assignor to International Harvester Co., Chicago, Ill.

Filed Aug. 7, 1981, Ser. No. 290,903

Int. Cl.³ A01B *3/46, 3/28*

U.S. Cl. 172—225 **10 Claims**



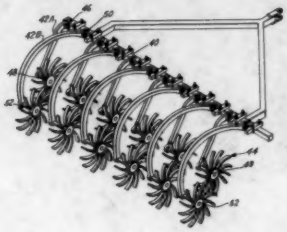
1. A fully mounted plow system adapted to be mounted on and pulled by a tractor, said system comprising a hitch assembly including link arms adapted to be supported by the tractor at their forward ends such that they are capable of slight pivotal displacement about vertical axes, a forecarriage unit mounted on the rearward ends of said link arms such that a slight pivotal movement about vertical axes are permitted therebetween, an elongated plow beam extending generally in a horizontal plane and inclined to the direction of forward travel, said forecarriage being pivotally attached to said plow beam about a generally vertical axis, a plurality of plow bottom assemblies each including a support bracket, each plow bottom assembly being pivotally attached through said support brackets along said plow beam such that said plow bottom assemblies are equally spaced along said plow beam, an elongated coupling member extending generally parallel to said plow beam and being pivotally connected to each of said support brackets forming a set of interconnected plow bottom assemblies, a coupling member pivotally attached at one end to said forecarriage unit and at its other end to the foremost plow bottom assembly, a double acting hydraulic cylinder anchored at one end to said plow beam and at its other end to said set of interconnected plow bottom assemblies such that actuation of said hydraulic cylinder will result in equal pivotal movement of each plow bottom assembly relative to said plow beam as well as a pivotal movement between said forecarriage unit and said plow beam about their pivotal connection.

4,415,041

MINIMUM TILL ROTARY HOE

Charles K. Fackler, Gibson City, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Nov. 13, 1981, Ser. No. 321,114
Int. Cl.³ A01B *39/08*
U.S. Cl. 172—551 **1 Claim**



1. An improved rotary hoe implement, comprising, in combination:

a plurality of generally circular, multiple tined, rotary hoe members, each hoe member including a center pivot axis about which the member rotates as it moves through earth;

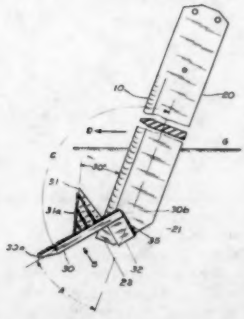
a tool bar and a support arm for each hoe member connected to the tool bar for mounting the hoe members with their pivot axis generally transverse to the direction of travel of the hoe members in the earth, alternate longer support arms being mounted over adjacent hoe members and positioned above the hoe members by a distance at least equal to or greater than 1.30, the radius of a hoe member, said support arms providing for the axis of mounting of adjacent hoe members being offset in the direction of the hoe member travel, said offset being less than the maximum diameter of the hoe members and greater than 0.8 times the diameter of the hoe member and defining means for partial overlap of the rotary path of adjacent hoe members to clean out field trash from the tines of adjacent hoe members.

4,415,042

REPLACEABLE RIPPER SHOE

Keith J. Cosson, Hwy. 85, P.O. Box 968, Eaton, Colo. 80615

Filed Aug. 20, 1981, Ser. No. 294,495
Int. Cl.³ A01B *13/08*
U.S. Cl. 172—749 **19 Claims**



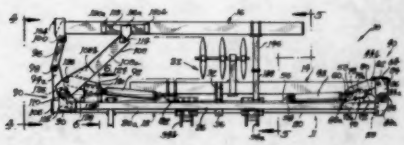
1. In combination, with a substantially vertical, straight ripper implement shank operably held by an agricultural cultivator implement, with the lower front edge portion of the shank sharpened and having a slot therein formed near its lower end and rearwardly of the shank from its front edge, and the shank having a substantially straight bottom edge surface parallel with the slot, the combination therewith of a single replaceable slip-on ripper shoe member adapted for slip-on frictional securement to the lower end of the shank wherein said shoe member comprises a plate portion having a sharpened leading edge portion and a downwardly extending stirrup portion secured to the underside of the rearward portion of said plate, and an upstanding rigid fin having a leading edge, said fin being secured to the plate midway of its ends on the side thereof opposite from the stirrup, with said slot and said rearward portion of said plate being of respective sizes with relation to each other for adapting said rearward portion of the plate to be frictionally fit inserted into and be frictionally held by the slot, and with said stirrup being of a size adapting it to frictionally fit snugly over the portion of the shank below the slot for a frictional stirrup holding of the replaceable shoe member onto said lower end of the ripper shank, and whereby upon use of the implement cultivator ripper with the shoe so secured thereto said fin will divert the soil from directly striking the front lower edge of the sharpened ripper shank as it is drawn through the soil and consequently upon such ripper use said fin will reduce soil wear of the front lower sharp edge of the shank, and whereby the fin will prevent soil chunking damage to adjacent growing crop rows on row crop cultivation; wherein the leading edge of said fin is substantially vertical and is aligned with, and directly ahead of, the front edge of said shank member when said shank and shoe attachment are in working position.

4,415,043

TOOLBAR WITH WINGS FOLDABLE SUBSTANTIALLY 180 DEGREES

Howard D. Hadler, Kewanee, and James R. Kreftmeyer, Naperville, both of Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Oct. 1, 1981, Ser. No. 307,372
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—776 **12 Claims**



11. In a foldable frame assembly having a main frame section and lateral wing sections each of which is pivotally connected to the main frame section for folding movement between a first working position substantially longitudinally aligned with the main frame section and a second folded position raised substantially 180° about its pivot connection to said main frame section so as to overlie said main frame section, one of said wing sections being foldable to lie in relatively close proximity to said main frame section when in its folded position, and the other of said wing sections being foldable to overlie said main frame section and said one of said wing sections when in its folded position, the improvement comprising;

hinge mechanism means interconnecting said other of said wing sections to said main frame section including a first link pivotally connected at one end to said main frame section at a first pivot axis spaced from the longitudinal axis of said main frame section and pivotally connected at its opposite end to said other of said wing sections at a second pivot axis spaced from and parallel to said first pivot axis,

a second link pivotally connected at one end to said main frame section at a third pivot axis parallel to and spaced from said first pivot axis, and pivotally connected at its opposite end to said other of said wing sections at a fourth pivot axis parallel to and spaced from said second pivot axis,

said first and second links being cooperative to move said other of said wing sections from a position generally longitudinally aligned with said main frame section to a position overlying said main frame section and said one of said wing sections when in its folded position upon movement of said second link through a predetermined pivotal arc about said third pivot axis,

and operator means operatively associated with said second link and operative to move said second link through said predetermined pivotal arc.

4,415,044

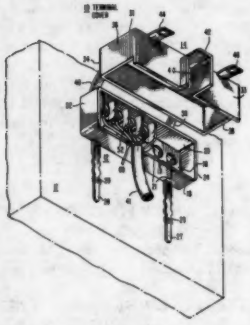
WEATHERPROOF TERMINAL COVER

Steven B. Davis, St. Mathews Township., Wake County, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1981, Ser. No. 252,684

Int. Cl.³ H01R *13/44, 13/52*

U.S. Cl. 174—138 F **8 Claims**



1. A one-piece terminal cover for providing a weatherproof enclosure externally of an associated field-mounted component for associated connectable incoming and outgoing conductors, said terminal cover comprising:

a first member having a back face adapted for external connection to an associated field-mounted component, a top face, a bottom face, and two side faces, said back face having at least one opening for communicating with an associated field-mounted component and for receiving therethrough associated outgoing conductors, said back face further having external raised portions around said opening for providing a gasket;

a second member having a front face, a top face, a bottom face, and two side faces, said bottom face having at least one opening for receiving therethrough associated incoming conductors;

means flexibly connecting said first and second members and for defining a closed position therebetween wherein said first and second members cooperate to define a weatherproof enclosure; and

means for locking said first and second members in said closed position.

4,415,045

OFFSHORE DRILLING OF LARGE DIAMETER HOLES IN ROCK FORMATIONS

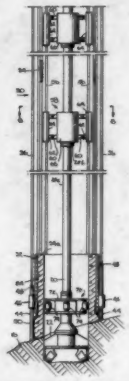
Lindsey J. Phares, Sugar Land, Tex., assignor to Raymond International Builders, Inc., Houston, Tex.

Filed Apr. 30, 1981, Ser. No. 259,046

Int. Cl.³ E21B *7/136*

U.S. Cl. 175—9 **3 Claims**

1. A method of drilling large diameter holes in a rock outcropping of uneven surface configuration on a sea bed, said method comprising the steps of positioning a form on said rock outcropping, pouring a hardenable fluid substance into said form so that said substance forms itself to the contours of said rock outcropping and so that said hardenable fluid substance attains a flat upper surface, allowing said substance to harden in said form, thereafter drilling, with a drill, into the flat upper



surface of the hardened substance to form in the substance a guide to hold the drill against lateral deflections which might otherwise occur when it encounters the underlying rock outcropping and then continuing to drill down through said substance and into said rock outcropping.

4,415,046

DEEP VIBRATOR APPARATUS AND METHOD OF USE

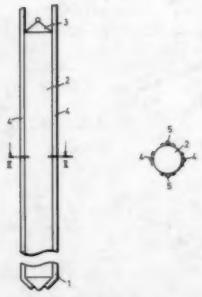
Franz Eichkorn, Renchen, Fed. Rep. of Germany, assignor to Fritz Pollems Kommanditgesellshaft, Fed. Rep. of Germany

Filed Apr. 30, 1981, Ser. No. 259,150

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016841

Int. Cl.³ E21B *7/18, 7/24*

U.S. Cl. 175—56 **6 Claims**



1. A deep vibrator comprising a suspension tube having a longitudinal axis; a propulsion head secured to the lower end of said suspension tube and adapted for vibration in a transverse direction with respect to the longitudinal axis of said suspension tube such that an annular space is formed around said propulsion head; a plurality of pipes fixedly attached along the length of the outer wall of said suspension tube; and each of said pipes ending in a nozzle and having at least one additional nozzle along its length, said nozzles adapted for spraying water under pressure into the annular space around said suspension tube as said suspension tube is inserted into the ground, thereby washing ground material toward said propulsion head.

5. A process for inserting a deep vibrator into the ground,

said deep vibrator comprising a suspension tube having a longitudinal axis and a propulsion head secured to the lower end of said suspension tube, comprising the steps of:

vibrating said propulsion head in a transverse direction with respect to the longitudinal axis of said suspension tube as the propulsion head is inserted into the ground;

ejecting water under pressure from said suspension tube in the area of a the tip of said propulsion head as said propulsion head is inserted into the ground; and

releasing water under pressure from a plurality of sites along the length of said suspension tube into the ground material surrounding said suspension tube as said propulsion head is inserted into the ground causing portions of said ground material to be washed into the annular space surrounding said propulsion head.

4,415,047

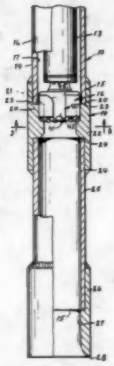
DOWNHOLE CASE DRIVING APPARATUS FOR IMPACT DRILLS

Gerald L. Adcock, 2033 3rd Ave. North, Lewiston, Id. 83501

Filed Nov. 24, 1980, Ser. No. 210,122

Int. Cl.³ E21B *17/14*

U.S. Cl. 175—305 **10 Claims**



1. Apparatus for pulling a well casing downwardly into a drilled hole from a downhole position adjacent the casing bottom end utilizing a drill string having a downhole percussion drill tool at a lower end thereof, comprising:

an anvil affixed to the casing spaced upwardly from the casing bottom end to project inwardly into the casing, defining a lower casing section extending between the anvil and the casing bottom end;

a tubular drive shoe affixed coaxially to the casing bottom end with a central open bore allowing free elevational passage of the drill tool therethrough;

said anvil having an anvil surface within the casing thereon facing upwardly; and

percussion drill bit means mountable to the downhole percussion drill tool for normally drilling earth material below the drive shoe with means thereon for selectively engaging the percussion drill bit means with the anvil surface to drive the anvil and casing downwardly with the lower casing section and drive shoe projecting through the drilled earth material forward of the bit means when the percussion drill bit is engaged with the anvil surface.

4,415,048

WEIGHT MEASURING, PRICE COMPUTING AND PACKING APPARATUS

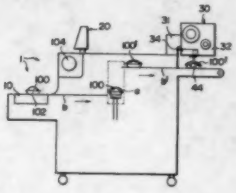
Kazuharu Teraoka, a/c Teraoka Seikosho Co., Ltd., 13-12, Kugahara 5-chome, Ota-ku, Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,721

Claims priority, application Japan, Feb. 26, 1980, 55-23601; Oct. 21, 1980, 55-147061; Oct. 30, 1980, 55-152730; Oct. 30, 1980, 55-152731

Int. Cl.³ G01G *23/38, 23/22, 23/00, 13/00*

U.S. Cl. 177—5 **46 Claims**



1. A weight measuring, price computing and packing apparatus for a commodity comprising:

(a) a packing section for automatically packing said commodity;

(b) an inlet passage located upstream of said packing section;

(c) an outlet passage located downstream of said packing section;

(d) a weight measuring unit located along said inlet passage for measuring the weight of said commodity, said weight measuring unit comprising a main weight measuring section and an input control section;

(e) a printing and labelling unit located along said outlet passage for printing a label and sticking said label on said packed commodity, said printing and labelling unit having a printing section and a label sticking section, said printing section including means for printing necessary data on said label and for thereafter transferring said printed label to said label sticking section, said label sticking section comprising means for automatically sticking a printed label to said packed commodity;

(f) a mechanism for controlling the printing operation in accordance with input data delivered from said weight measuring unit to said printing and labelling unit; and

(g) a commodity height detecting means and a commodity adjusting means, wherein said weight measuring unit and said printing and labelling unit are connected by a control mechanism.

4,415,049

ELECTRICALLY POWERED VEHICLE CONTROL

John A. Wereb, Concord, Ohio, assignor to Instrument Components Co., Inc., Painesville, Ohio

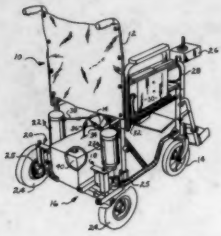
Filed Sep. 14, 1981, Ser. No. 301,872

Int. Cl.³ B62D *11/04*

U.S. Cl. 180—6.5 **8 Claims**

6. An electrically powered vehicle having a differential drive and steering system comprising right and left drive wheel assemblies which each include a direct current motor operably connected to a drive wheel, a source of electric power for providing a power signal to each of said motors, manually adjustable means for providing electrical control signals indicative of desired drive wheel speeds, means for providing feedback signals indicative of actual drive wheel speeds, and an electrical control circuit including a closed loop control circuit to provide a speed command signal proportional in magnitude to differences between said control and feedback signals, a motor energizing network to vary the power signal to said motor in proportion with the magnitude of said speed command signal at values thereof in excess of a first predetermined value, and a dynamic brake network including brake means

operable to decelerate each of said motors together with its associated drive wheel in response to speed command signals lower in value than a second predetermined value, said dynamic brake network including power signal modulator means for varying said power signal in accordance with the magnitude of said speed command signal, said power signal modulator means including energizing switch means operable to electrically connect and disconnect said source of electric power from said motor, said power signal modulator means also including a source for providing a fixed frequency and amplitude reference signal which is compared with said speed command signal to provide a power modulating control signal which is proportional to said speed command signal.

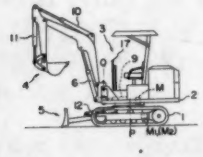


4,415,050

DRIVE PUMP ARRANGEMENT FOR WORKING VEHICLE

Chikashi Nishida, late of Osaka (by Shinobus Nishida, Legal representative); Yoshishiro Okita, Sakai, Japan; Ryoichi Tanaka, Neyagawa, Japan; Takeshi Kajimoto, and Hitoo Nasu, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Dec. 28, 1981, Ser. No. 335,286
Claims priority, application Japan, Dec. 26, 1980, 55-191014
Int. Cl.³ B62D *11/04*
U.S. Cl. 180—6.48 **3 Claims**



1. A working vehicle having two pumps P1, P2 for driving hydraulic motors M1, M2 provided for opposite running devices **1**, **1** respectively, a valve mechanism for bringing the vehicle into a low-speed state wherein a fluid is supplied from the pumps P1, P2 to the motors M1, M2 respectively or alternatively into a high-speed state wherein the combined fluid from the pumps P1, P2 is supplied to the motors M1, M2 in series, valves V2, V4 for reversibly rotating and stopping the motors M1, M2 respectively, and manual operating means **17**, **17** provided for the valves V2, V4 respectively, the working vehicle comprising an operating assembly **15** provided for the valve mechanism and including a power supply circuit C for an electric operating unit **16** or **16*a*** for bringing the valve mechanism into the high-speed state when energized, a manual switch S1, a safety switch S2 provided with a driven cam **18**, the switches S1, S2 being connected in series with the power supply circuit C, the safety switch S2 being attached to one of the manual operating means **17**, **17**, and a cam-type operating member **19** provided for the driven cam **18** and attached to the other operating means **17**, the safety switch S2 being closed when both the operating means **17**, **17** are in a specific position relative to each other for running the vehicle straight, the safety switch S2 being opened when the operating means **17**, **17** are brought out of the specific relative position to run the vehicle in a turning state.

4,415,051

MULTIPLE PERSONNEL TRANSPORTER VEHICLE FOR LOW VEIN MINES

Jerry F. Taylor, Mt. Vernon, Ill., assignor to Mine Equipment Company, Mt. Vernon, Ill.

Filed May 8, 1981, Ser. No. 261,922
Int. Cl.³ B62D *23/00*; B60K *1/00*
U.S. Cl. 180—65 R **8 Claims**

1. A mine car, comprising:

an elongated, personnel-carrying body;

surface-engaging means supporting said body; and

electric power means drivingly coupled to said surface-engaging means for propelling said car,

the maximum height of said body supported on said surface-engaging means being as low as about 26 inches,

said body including

structure defining a first personnel compartment for accommodating at least two persons in a generally horizontal position, said structure comprising a bottom wall, a pair of upstanding, opposed end walls spaced apart a distance greater than the length of an average man's legs and less than an average man's height, and means defining an access opening between said end walls permitting entry into said compartment by said persons;

means defining a compartment forwardly of and separate from said personnel compartment and configured for accommodating a driver in a substantially horizontal position;

means defining second and third personnel compartments respectively disposed on opposite sides of said driver compartment and forwardly of the first compartment and also configured for accommodating individuals in substantially horizontal positions;

electric battery means operatively coupled to said power means and situated rearwardly of said first personnel compartment.

4,415,052

ENGINE COMPARTMENT ENCLOSURE

Larry C. Gauer, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 8, 1981, Ser. No. 300,339
Int. Cl.³ B62D *25/12*
U.S. Cl. 180—69 R **4 Claims**

1. In an engine enclosure having a top, side shields and opposite ends operatively enclosing an engine, the improvement comprising:

a first panel hingedly supported from the enclosure top and extending downwardly therefrom to form a portion of the enclosure side;

a first hinge means joining said panel to the enclosure top for pivotal movement relative thereto;

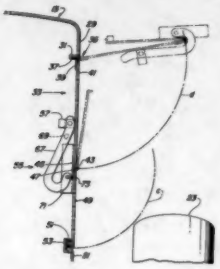
a second hingedly supported panel, forming another portion of the enclosure side, extending downwardly from said

first panel with an edge of said second panel spaced from the lowermost side edge of enclosure side;

a second hinge means joining said second panel to said first panel for pivotal movement relative thereto;

a restraining means for supporting and generally maintaining said second panel co-planer with said first panel in a first position and generally parallel and opposite to said first panel in a second position including,

a mounting brace fixably mounted to said second panel;



a J-member having a general J configuration, having its lower curved portion pivotably mounted to said mounting brace to allow said curved portion to pass below said first panel such that the stem of said member has a generally vertical extension;

means for maintaining said stem of said J-member in close proximity to said first panel to allow said stem vertical motion, and for restraining motion of said J-member when said second panel is in a second position.

4,415,053

TRACTOR DRIVE MECHANISM

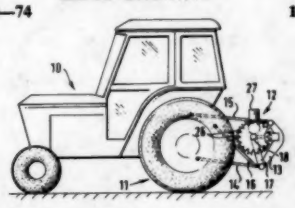
Dennis R. Fulford, Colchester, England, assignor to A. F. Trenchers Limited, England

Filed Jan. 16, 1981, Ser. No. 225,360

Claims priority, application United Kingdom, Jan. 16, 1980, 8001517

Int. Cl.³ B60K *25/08*

U.S. Cl. 180—74 **16 Claims**



1. A drive mechanism for a tractor, which mechanism comprises a support frame adapted for mounting on a tractor, at least one drive wheel rotatably supported on said support frame so that said drive wheel is adjacent a rear wheel of the tractor when said frame is mounted on a tractor, said drive wheel defining a ring of internally-directed teeth, operating means arranged to move said drive wheel to and from a drive position in which position said drive wheel drivingly engages a tire of the adjacent rear wheel of the tractor, and power drive means arranged to effect rotation of said drive wheel at least when said operating means has moved said drive wheel to said drive position, said power drive means including a power-driven toothed wheel which is meshed with said internally-directed teeth of said drive wheel.

4,415,054

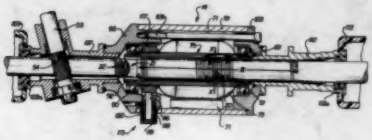
STEERING GEAR

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 5, 1982, Ser. No. 405,705

Int. Cl.³ B62D *5/04*

U.S. Cl. 180—79.1 **6 Claims**



1. An assembly for pivoting the steerable wheels of a vehicle upon manual rotation of a steering wheel, said assembly comprising:

a member which is axially movable to effect turning movement of the steerable vehicle wheels;

ball screw and nut means for applying force to said member to move said member axially, said ball screw and nut means including;

thread means connected with said member, rotatable nut means circumscribing at least a portion of said thread means and ball means for transmitting forces between said nut means and said thread means;

an electric motor for rotating said nut means about the central axis of said member, said electric motor including a stator for providing a magnetic field, and a rotor disposed in a coaxial relationship with said member and rotatable under the influence of the magnetic field from said stator to rotate said nut means relative to said thread means;

control means for energizing the stator of said electric motor to rotate said motor and nut means in response to rotation of the steering wheel; and

a rack and pinion gear set for applying force transmitted from the steering wheel to said member and for moving said member axially and imparting rotary motion to said nut means to turn the steerable vehicle wheels upon failure of said electric motor, said rack and pinion gear set including

a pinion gear rotatable with the steering wheel and

a rack gear disposed in meshing engagement with said pinion gear and connected with said member.

4,415,055

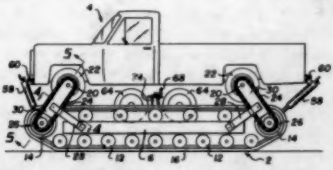
TRACKED VEHICLE

Min H. Ahn, 5111 Maple Rd., Richmond, British Columbia, Canada

Filed Aug. 3, 1981, Ser. No. 289,024

Int. Cl.³ B62D *55/08*

U.S. Cl. 180—198 **7 Claims**



1. A tracked vehicle to receive a wheeled vehicle and to be driven by the wheeled vehicle, the tracked vehicle comprising;

a chassis;

guide wheels mounted on the chassis at each side;

drive wheels mounted at at least the rear of the chassis, at each side;

a track at each side of the vehicle driven by the drive wheels and guided by the guide wheels;

first drive members attached to each drive wheel;

said drive member being adapted to receive a drive transmission means;

the chassis being adapted to receive and retain the wheeled vehicle by jacks contacting the front and rear of the wheeled vehicle and contacting the tracked vehicle; and

second drive members attachable to the driven wheels of the wheeled vehicle to receive said drive transmission means whereby driving of the driven wheels of the wheeled vehicle drives the tracks of the tracked vehicle.

4,415,056

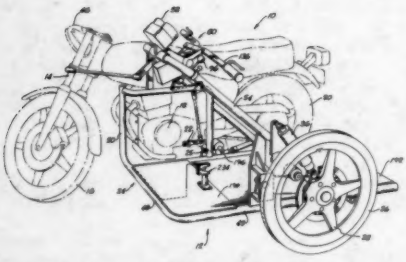
HANDICAPPED-DRIVEN SIDECAR

Frederick A. Smith, 5410 E. Saginaw, Fresno, Calif. 93727

Filed Dec. 11, 1981, Ser. No. 329,691

Int. Cl.³ B62K *27/00*

U.S. Cl. 180—210 **11 Claims**



1. A handicapped driven apparatus comprising:

(a) a motorcycle having a front fork assembly, an automatic transmission and conventional hand brake and throttle controls;

(b) a side car designed and constructed to accommodate therein a conventional wheelchair and occupant, said sidecar attached to said motorcycle;

(c) means attached to said sidecar for control by the wheelchair occupant of the speed of the apparatus, said means comprising a main gear box attached to the sidecar, a pair of interdigitating gears housed within said gear box, a rotatable arm attached to a first gear of said gear pair such that rotational movement of said arm is communicated to said first gear and hence to the second gear of said gear pair, said arm extending out of said gear box toward the wheelchair occupant, a main actuating bar pivotally attached to said arm and within easy reach of the wheelchair occupant such that rotational movement of said actuating bar is communicated to said arm while pivotal movement of said actuating bar is not communicated to said arm, a throttle bar for communicating movement of said actuating bar to the throttle control of the motorcycle to control thereby the supply of fuel to the motorcycle, a linkage attached to the main actuating bar and to each of the hand brake controls, which controls are attached to the sidecar, such that pivotal movement of the actuating bar operates the brake controls, and

(d) means attached to the sidecar and within each reach of the wheelchair occupant for controlling the direction of the apparatus and the transmission mode of the motorcycle.

4,415,057

REAR WHEEL DAMPER DEVICE FOR MOTORCYCLE

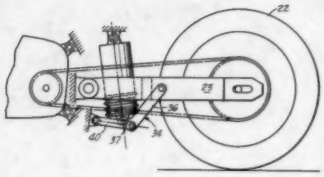
Ken Yamaguchi, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,036

Claims priority, application Japan, Sep. 23, 1980, 55-132082; Sep. 23, 1980, 55-132083; Sep. 23, 1980, 55-132085; Sep. 24, 1980, 55-132694

Int. Cl.³ B62K *25/20*

U.S. Cl. 180—227 **11 Claims**



9. In a rear wheel suspension device for a motorcycle having a main frame, the combination of

a rear wheel support frame having side bars and a cross member extending between said side bars;

a horizontal bearing member pivotally mounting said support frame to the main frame;

an upright damper pivoted to the main frame at its upper end and extending between said side bars and between said cross member and said horizontal bearing member, the lower end of said upright damper being below said side bars;

a rigid link having a horizontal support member and a pair of parallel bell crank members, each bell crank member having a long arm and a short arm, one end of each said long arm being pivotally mounted to a said side bar and one end of each said short arm being pivotally mounted to the lower end of said upright damper; and

two tension rods being pivotally connected to said rigid links at a distance from said one end of said long arms and at a distance from said one end of said short arms and pivotally mounted to the main frame, said tension rods being spaced apart on either end of said horizontal support member.

4,415,058

FOUR-WHEEL DRIVE SYSTEM FOR A WHEELED VEHICLE

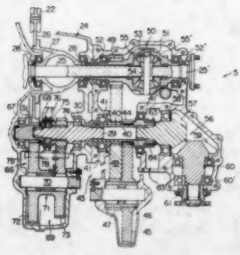
Kunihiko Suzuki, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 30, 1981, Ser. No. 335,680

Claims priority, application Japan, Jan. 9, 1981, 56-2527

Int. Cl.³ B60K *17/34*

U.S. Cl. 180—247 **5 Claims**



1. A four-wheel drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road

wheels and a pair of rear road wheels, comprising in combination:

a power unit having an output shaft having an axis of rotation in a lateral direction of the vehicle,

a power transmission gear unit including transmission input and output shafts each having an axis of rotation in a lateral direction of the vehicle, and gears mounted on the transmission input and output shafts and arranged to be capable of selectively producing a plurality of gear ratios between the transmission input and output shafts, the output shaft of the power unit being operatively coupled to the transmission input shaft, said gears including a transmission output gear rotatable with the transmission output shafts; and

a power distribution gear unit comprising (a) a power distribution shaft having an axis of rotation in a lateral direction of the vehicle, (b) a power distribution input gear coaxially rotatable with respect to the power distribution shaft, (c) an intermediate power transfer gear operatively intervening between the transmission output gear and the power distribution input gear and operative to transmit driving power therethrough from the transmission output shaft to the power distribution shaft, (d) two-wheel/four-wheel shifting clutch means arranged on said power distribution shaft and operative to split into two driving power components the driving power carried to the power distribution shaft, (e) a final reduction gear assembly operative to transmit therethrough one of said driving power components with reduction of speed at a predetermined ratio, (f) a pair of drive shafts axially aligned with each other in a lateral direction of the vehicle and operatively connected to one of said pair of front road wheels and said pair of rear road wheels, (g) a wheel drive differential gear assembly mounted on said drive shafts, said final reduction gear assembly operatively intervening between said two-wheel/four-wheel shifting clutch means and said wheel drive differential gear assembly, (h) a right-angle power transfer gear assembly operative to transmit the other of said driving power components to the other of said pair of front road wheels and said pair of rear road wheels, said right-angle power transfer gear assembly including a driven gear having an axis of rotation in a fore-and-aft direction of the vehicle, and (i) a low-and-high speed shifting clutch mechanism which comprises a low-speed gear coaxially rotatable on the power distribution shaft, clutch means operative to provide coupling engagement selectively between the power distribution input gear and the power distribution shaft and between said low-speed gear and the power distribution shaft, and a reduction gear assembly which has an axis of rotation substantially parallel with the axis of rotation of said power distribution shaft and which is held in mesh with both of the power distribution input gear and said low-speed gear.

4,415,059

MUFFLER

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Yokohama, Japan

Filed Jun. 17, 1982, Ser. No. 389,267

Claims priority, application Japan, Jul. 22, 1981, 56-114888

Int. Cl.³ F01N *1/02*

U.S. Cl. 181—250 **7 Claims**

1. A muffler comprising:

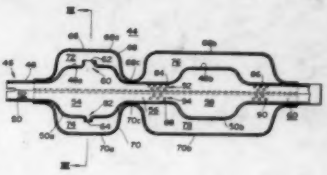
an inner shell having first and second expansion chambers which are coaxially arranged and connected to each other through a communicating passage;

an outer shell spacedly covering said inner shell to define therebetween first, second, third and fourth isolated chambers, said first and second isolated chambers surrounding said first expansion chamber, while, said third and fourth isolated chambers surrounding said second expansion chamber;

first means connecting said first expansion chamber with said first isolated chamber to allow the latter to show a sound damping effect;

second means connecting said first expansion chamber with said second isolated chamber to allow the latter to show a sound damping effect;

third means connecting the upstream and downstream portions of said second expansion chamber with said third chamber to allow the latter to show a sound damping effect;



fourth means connecting the upstream and downstream portions of said second expansion chamber with said fourth chamber to allow the latter to show a sound damping effect;

an inlet means leading to said first expansion chamber to introduce thereinto an exhaust issued from a noise source; and

an outlet means extending from said second expansion chamber to the open air to discharge the exhaust in the second expansion chamber into the atmosphere.

4,415,060

MUFFLER FOR COMPRESSORS

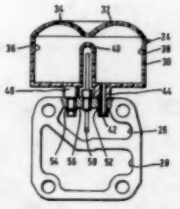
Alfredo Bar, Pavia, Italy, assignor to Necchi, S.p.A., Pavia, Italy

Filed Feb. 17, 1982, Ser. No. 349,474

Claims priority, application Italy, Feb. 24, 1981, 42905 A/81

Int. Cl.³ F01N *1/08;* **F25D** *19/00*

U.S. Cl. 181—272 **1 Claim**



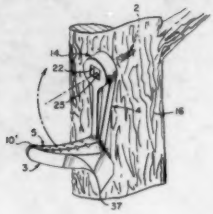
1. A muffler for compressors which compressors consist of an electric motor, a cylinder and a head for the cylinder in which are located the intake and compression chambers for refrigerant gas, comprising a muffler body constructed from plastic material resistant to the action of the chemical agents of the refrigerant gas and the lubricating oil and which consists of first and second chambers separated partially by a central wall, said muffler body having a hole therein communicating with said first chamber for the passage of said refrigerant gas and an external small tube extending therefrom through which said second chamber communicates with the intake chamber located in said head, a second small tube extending from the muffler body below said first chamber and co-operating with said small tube interconnecting the second chamber and the intake chamber of said head, said head having two holes communicating with said intake chamber for receiving and projecting both small tubes into said intake chamber, and two rings one on each tube which hold the muffler body to the head.

4,415,061

PORTABLE TREE CLIMBING DEVICE

Leonard S. Meyer, Columbia, S.C., assignor to Victor United, Inc., Chicago, Ill.

Filed Sep. 1, 1982, Ser. No. 413,760
Int. Cl.³ A63B *27/00, 29/04*
U.S. Cl. 182—92 **12 Claims**



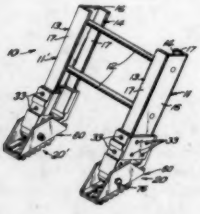
1. A portable step unit for climbing a tree or the like comprising, an angular climbing member provided with an upright crank arm and an offset step arm, said crank arm including opposite inner and outer faces and having a lower end from which said step arm projects, a mounting portion adjacent an opposite upper end of said crank arm and having a socket therein intermediate said inner and outer faces, said socket configured to accept a fastener member angular head therein, said mounting head including a bore communicating with said socket and inner face and adapted to pass a fastener member threaded portion therethrough, said mounting head having a passageway communicating with said socket and outer face, said passageway having a radial periphery configured to allow axial passage of a fastener member angular head therethrough into said socket while precluding angular displacement of said head within sad passageway, and captivating means in said socket precluding axial displacement of said fastener member head toward said outer face when said head is arcuately shifted within said socket.

4,415,062

LADDER FOOT

Jonathan L. Shaw, Clinton Township, Hunterdon County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,212
Int. Cl.³ E06C *7/44, 7/46*
U.S. Cl. 182—109 **11 Claims**



1. A foot for a ladder having longitudinal rails, lateral rungs and transversely separated front and back sides for said rails, said foot comprising:

(1) bracket means attachable at its upper end to the bottom of one such rail and having

(a) a stud extending downward from said end at the back of said bracket means and having front and back sides separated by the transverse thickness of said stud, said stud

(i) having an upper range over which its front and back sides are substantially longitudinal and said thickness remains substantially the same, and

(ii) a lower range in which the radial distance from any point therein on such front side to any point therein on such back side at most approximates said thickness in said upper range, and said bracket means also having

(b) upper stop means frontward of the front side of said stud at the top of its upper range;

(2) a shoe of U-shape in lateral cross section and including:

(a) a central lateral sole plate disposed outward of said bracket means, and

(b) a pair of upper plates extending from said sole plate towards such bracket means to straddle laterally opposite sides thereof, and

(3) a lateral pin fixedly secured at its opposite ends with said upper plates, such pin passing from one to the other of such plates through said bracket means adjacent said stud to be movable longitudinally relative thereto over such upper range, the separation between said pin and sole plate permitting the upper range of said stud to fit therebetween with a clearance facilitating such longitudinal movement; and

(4) said pin pivotally coupling said shoe to said bracket means in a manner which

(a) when said pin is in such lower range, permits angular adjustment of said shoe between flat and toe-down positions for which said sole plate is, respectively, transversely disposed in contact with the lower end of said bracket means and longitudinally disposed at the back side thereof, and

(b) when said pin in said upper range, said shoe is locked in toe-down position, and

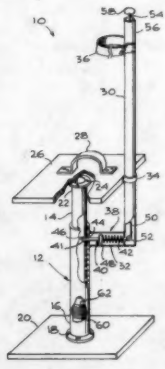
(c) when said pin is at the top of said upper range, said upper stop means contacts said pin and is adapted to transmit longitudinal force thereto.

4,415,063

STILT DEVICE

James Hutchison, 2780 Calle Bienvendo, Thousand Oaks, Calif. 91360

Filed Jul. 26, 1982, Ser. No. 402,024
Int. Cl.³ A63B *25/00*
U.S. Cl. 182—230 **16 Claims**



1. An improved leg stilt device, said device comprising, in combination:

(a) a first hollow vertical support member;

(b) a second vertical support member disposed in telescoping relation inside said first member and extending vertically therefrom;

(c) a horizontal support platform connected to the upper end of said vertical member which extends up from the other

of said vertical members and adapted to receive one leg of a user;

(d) a broad, flat, horizontal base connected to the lower end of the lowermost-extending one of said vertical members to impart stability to said device;

(e) a leg brace extending above and connected to said platform; and,

(f) stilt height adjusting means releasably coupling said first and second vertical members together, said adjusting means comprising, in combination:

i. means for moving said platform vertically,

ii. pin means releasably disposable through aligned horizontal openings in said vertical members, and

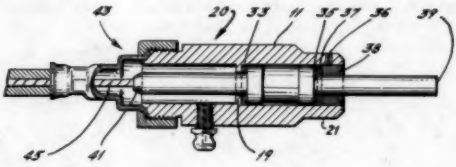
iii. pin moving means, including pin retraction means disposed, in part, above said platform in said leg brace accessible to the user of said device and connected to said pin for moving said pin out of said openings and into the unlocked position, and pin biasing means urging said pin into said aligned openings to lock said vertical members together, said pins means and pin moving means being concealed within said device and protected against damage.

4,415,064

SPEEDOMETER CABLE LUBRICATION TOOL

Casey Oliemuller, 1209 Orchid Rd., Warminster, Pa. 18974

Filed Aug. 14, 1981, Ser. No. 293,031
Int. Cl.³ F16N *1/00, 13/08*
U.S. Cl. 184—15 R **20 Claims**



1. A lubrication tool for an encased speedometer cable, said cable being disconnectable from a transmission to provide a free coupling and casing end thereof with the speedometer cable end projecting therefrom, comprising:

means for providing a sealed connection with the end of said speedometer cable casing, said sealed connection means including a lubrication fitting; and

means for rotatably coupling to said end of said speedometer cable, said rotatable coupling means being positioned within said sealed connection means and being capable of rotating said speedometer cable end.

4,415,065

RESTAURANT OR RETAIL VENDING FACILITY

Gary O. Sandstedt, 3837 Harrison Blvd., Kansas City, Mo. 64109

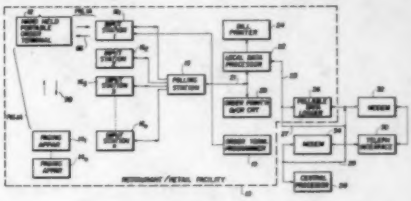
Filed Nov. 17, 1980, Ser. No. 207,744
Int. Cl.³ E04H *3/04;* **G06F** *3/02*
U.S. Cl. 186—39 **13 Claims**

1. In a vending system including a portable data terminal adapted to interact with a data processor for implementing an order transaction, the combination comprising:

a plurality of ordering stations, each having respective bidirectional paging transceiver apparatus of a selected energy type adapted to communicate with like paging transceiver apparatus located in at least one portable hand held ordering terminal;

at least one portable hand held ordering terminal including, like transceiver apparatus of said selected energy type adapted to provide an indication of a page to an operator carrying said ordering terminal and to provide operator communications with said ordering stations and any other location having like transceiver apparatus of said selected energy type, a first digital memory, means for entering digital data corresponding to an order transaction into said first memory for temporary storage, means providing a visual instructional sequence to the operator for properly entering the order data into said first memory and providing error indicator for improper operator entry, a second digital memory and being of a down loaded reprogrammable type having stored data therein corresponding to a programmed library of product codes of orderable items and being operable to output an alpha-numeric code sequence of an ordered item in response to an order entry by said operator, means providing a print out of each ordered item in alpha-numeric form and means coupled to said first memory for transferring said data in temporary storage to a selectively addressed wireless communications link under program control;

said communications link comprising a pollable bidirectional wireless communications link of a selected type including



a controlled polling station, a plurality of pollable input stations coupled to said polling station, said polling station being operable to repetitively interrogate said plurality of input stations and lock onto an input station in communication with said hand held ordering terminal to accept data therefrom and couple said data to means providing a visual representation of an order entry and to a data processor;

means coupled to said communications link and being responsive to the data from said temporary storage provided by said first memory to provide a visual representation of the order entry in said terminal, said visual representation means being located at an order filling location separate from said ordering station;

a data processor coupled to said communications link and being responsive to data translated thereto from said first memory of said hand held ordering terminal to maintain a running account of the transaction and provide billing information therefrom; and

means coupled to said data processor for providing a printed record including a bill at the end of the transaction.

4,415,066

MANHOLE SERVICE VEHICLE

Alphonse J. Mensik, 7933 127th Pl. NE., Kirkland, Wash. 98033

Filed Jun. 5, 1980, Ser. No. 156,805
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R **22 Claims**

1. A manhole service vehicle comprising:

a. frame means;

b. wheels mounted on said frame means for easy movement of said vehicle;

c. top, bottom, side and front and rear wall means mounted on said frame means to provide an enclosed, sheltered, work space within said vehicle within which a workman may work while standing at least generally upright during normal use of the vehicle for its intended purpose;

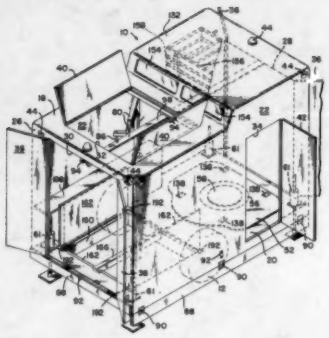
d. a selectively openable and closeable door means in at least one of said side, front and rear wall means of said vehicle,

said door means being sized and located to permit the easy entry and exit of said workman into and out of said enclosed working space within said vehicle;

e. wherein said bottom wall means of said vehicle defines, within said workspace, a substantially flat, horizontal workfloor means within said vehicle upon which said workman can walk, during normal use of the vehicle for its intended purpose;

and

f. wherein said bottom wall means of said vehicle defines at least one bottom wall opening means wherein said bottom wall opening means is provided with a cover adapted to



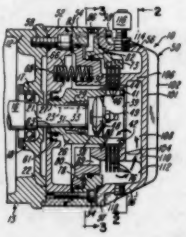
prevent the entry of debris of the elements into said vehicle when said bottom wall opening means is not being used, wherein said bottom wall opening means is at least partially surrounded by said workfloor means, is sized to easily permit a workman to pass therethrough, and wherein said vehicle and bottom wall opening means are positioned, during use of the manhole service vehicle, over a manhole to enable said workman to have access to said manhole from the interior of said vehicle and to have access to the interior of said vehicle from said manhole through said bottom wall opening means while said workman and said manhole are protected from the environment by said service vehicle.

4,415,067

LIQUID COOLED BRAKE UNIT

Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Fairfield, Ohio

Filed May 29, 1981, Ser. No. 268,339
Int. Cl.³ F16D *55/36*
U.S. Cl. 188—71.5 **16 Claims**



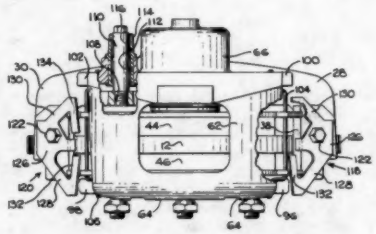
1. An improved brake unit adapted to be mounted on a motor for quickly stopping the rotation of a shaft projecting from the motor, said brake unit comprising a hub member having a center bore for receiving the shaft and including an annular portion projecting axially from a mounting portion adapted to engage the shaft to define a liquid coolant inlet, means for rigidly securing said hub member to the shaft, a plurality of annular brake discs mounted on said annular portion of said hub member for rotation therewith and for axial movement relative to said hub member, said annular portion of said hub member having circumferentially spaced and generally radially extending passages connecting said inlet to the inner portions of said brake discs, a housing surrounding said hub member, a liquid coolant within said housing, means connected to said housing and supporting a plurality of non-rotatable annular brake plates disposed between said brake discs in interfitting relation, said coolant being forced outwardly from said inlet through said passages and between said brake discs and plates in response to rotation of said hub member and said brake discs, an annular non-rotating piston supported by said housing concentrically with said hub member and for axial movement relative to said hub member, means for moving said piston axially to effect axial compression and release of said brake discs and plates, said housing including an end closure portion for confining said coolant within said housing, and means defining a passage within said housing for recirculating the coolant from said brake discs and plates and within the lower portion of said housing to said inlet of said hub member.

4,415,068

DISC BRAKE AND ANTIRATTLE SPRING THEREFOR

Bert A. Gumkowski, South Bend, and John F. Limberg, Granger, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 16, 1981, Ser. No. 283,756
Int. Cl.³ F16D *55/22*
U.S. Cl. 188—72.3 **1 Claim**



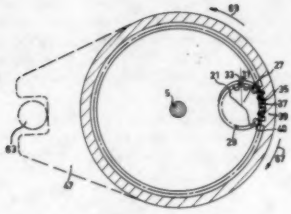
1. A disc brake of the type having a rotatable brake disc, a caliper straddling said brake disc and cooperating with a pair of friction elements to urge the latter axially into engagement with said brake disc, each of said friction elements having a backing plate, a non-rotatable support member supporting said caliper, said support member including a pair of support arms opposing rotation of said pair of friction elements, and an antirattle spring engaging said pair of friction elements to restrain rattling thereof, the improvement wherein said antirattle spring includes a body portion, a pair of divergent arms extending axially outwardly from said body portion to a position outside said pair of friction elements, a pair of resilient arms integral with said pair of divergent arms, respectively, and extending axially toward one another and radially toward said disc from said pair of divergent arms to engage said pair of friction elements, said body portion being secured to the radially outer surface of one of said support arms and said divergent and resilient arms extending substantially in a direction toward said other support arm in order to position said pair of resilient arms on top of said pair of friction elements.

4,415,069

BRAKING DEVICE FOR THE COVER OF A CHAMBER IN A RECORDING AND/OR REPRODUCING APPARATUS

Kurt Eisemann, Berlin, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1981, Ser. No. 255,922
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026909
Int. Cl.³ F16D *63/00, 41/04;* G11B *1/00*
U.S. Cl. 188—82.84 4 Claims



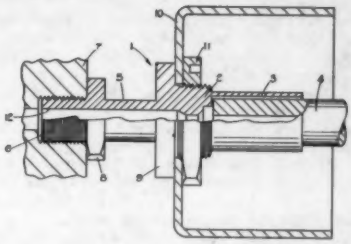
1. A braking device, comprising:
a non-rotatable plate;
a shaft connected to said plate and extending generally in a direction perpendicular therefrom;
a first member rotatably arranged on said shaft, for movement in a first direction and in a second direction opposite to said first direction, said first member directions lying in a plane generally transverse of said shaft;
a second member coaxial with said first member and rotatably arranged on said shaft between said plate and said first member, for movement in a plane parallel to said first member plane;
a damping material provided between said plate and said second member, said plate and said second member being arranged such that said material contacts both said plate and said second member;
means, associated with said shaft, for urging said first and said second members simultaneously toward said plate; and
means, associated with said first and said second members, for uniting said first and said second members and providing simultaneous unidirectional rotation by said first and said second members only when said first member is rotated in said first direction, whereby said unidirectional rotation is damped by said material between said plate and said second member,
characterized in that said second member includes a damping disc having an edge, said first member includes an actuating disc coaxial with said damping disc, and
said uniting and providing means includes a recess provided in said damping disc and a plurality of teeth provided on said actuating disc, said recess adjoining said edge and having a shallow depth, said teeth being adjacent said edge and said recess, and said uniting and providing means further includes a toothed disc accomodated within said recess, said teeth of said toothed disc being meshed with said teeth of said actuating disc, said toothed disc having a thickness substantially corresponding to said depth of said recess, said recess being partly formed by an oval-shaped wall tangential to said toothed disc, and said wall being provided with a cam on a diameter of said recess, so that said toothed disc moves along said diameter toward said cam when said first member rotates in said first direction.

4,415,070

HOSE CONNECTOR

John F. Pickering, Rugby, England, and David Evans, Queenswood, South Africa, assignors to Lucas Industries Limited, Birmingham, England

Filed May 29, 1981, Ser. No. 268,240
Claims priority, application United Kingdom, Jun. 4, 1980, 8018244
Int. Cl.³ F16D *65/78*
U.S. Cl. 188—264 F 7 Claims



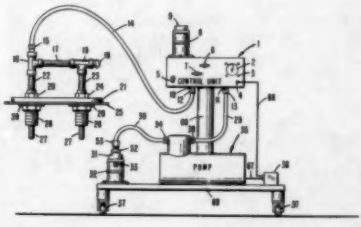
1. A hose connector for a hydraulic brake comprising a connector body having a first portion connectable to a flexible hydraulic fluid supply hose and a second portion, connectable to a brake actuator, a bore extending through the body and said first and second portions, means to secure said hose to said first portion in fluid communication with said bore and means to secure said second portion to said brake actuator in fluid tight relationship therewith so that hydraulic fluid flows in said bore in one direction towards said actuator when the brake is applied and in the opposite direction in said bore when the brake is retracted, and means for minimizing the amount of heat from the brake reaching said hose comprising a collector in at least a portion of said bore extending through said second body portion having a predetermined volume in relation to the brake actuator sufficient to contain at least a major part of the heated fluid expelled from the actuator during retraction of the brake.

4,415,071

DEVICE FOR BLEEDING BRAKES AND REFILLING BRAKE SYSTEM

Eric S. Butler; William H. Butler, Jr., both of Murfreesboro, 37130 and Malcolm H. Butler, Nashville, all of Tenn. 37212

Filed Jul. 27, 1981, Ser. No. 287,482
Int. Cl.³ B60T *11/30*
U.S. Cl. 188—352 1 Claim



1. A brake fluid changing device for changing brake fluid and bleeding the brake system of automobiles and trucks, the device having a control unit affixed to an adjustable stand mounted on a platform on wheels, a brake fluid and air extractor unit mounted on the platform on wheels, a brake fluid application container affixed to the top of the control unit, the control unit having an electrical on/off switch with electrical

conductors, a brake fluid application control valve, a vacuum meter indicator, a brake fluid and air extractor control valve, a brake fluid application container and a master cylinder brake reservior top with U-bolts, and controls means for controlling the operation of the fluid changing device, said control unit controlling the brake fluid and air extractor unit by the electrical on/off switch and a brake fluid and air control valve, the control unit of changing device controlling the brake fluid application by way of the brake fluid application control valve, the control unit being connected to the master cylinder brake reservior top by a heavy duty dual function extractor/application hose and the control unit being connected to the brake fluid and air extractor unit by a heavy duty vacuum hose, the brake fluid and air extractor unit of the fluid changing device having a vcuum pump, a brake fluid collection container, a brake fluid collection hose, a heavy duty vacuum hose, and a junction box, the vacuum pump of the extractor unit being connected to the control unit by a heavy duty vacuum hose, the vacuum pump being connected to the brake fluid collection container by a brake fluid collection hose, the junction box of the extractor unit being connected to the control unit by electrical conductors, the control unit of the brake fluid changing device controlling the action of the extractor unit such that the electrical on/off switch located on the control unit controls the suction action of the vacuum pump, with the master cylinder brake reservior top secured to the master cylinder of the vehicle, the on/off switch in the on position, the brake fluid application control valve in the closed position, and the brake fluid and air extractor control valve in the open position, the suction action of the vacuum pump causes the brake fluid and air to be extracted from the master cylinder of the motor vehicle's brake system, through the extractor/application hose to the control unit, through the heavy duty vacuum hose to the vacuum pump, through the brake fluid collection hose to the brake fluid collection container, new brake fluid being applied to the brake system by closing the brake fluid and air extractor control valve, by turning the electrical on/off switch to the off position, and by opening the brake fluid application control valve thereby new brake fluid travels from the brake fluid application container through the brake fluid application control valve to the control unit through the dual function extractor/application hose, through the master cylinder brake reservior top into the master cylinder into the motor vehicle brake system with the brake fluid application being closed when the master cylinder is full by pumping the brake pedal which pedal action causes brake fluid to be circulated throughout the brake system, and continuing this operation until brake fluid level in the brake fluid container stops dropping.

4,415,072

ONE-WAY CLUTCH

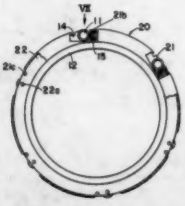
Masao Shoji, Fujisawa, and Yoshio Kinoshita, Chigasaki, both of Japan, assignors to NSK-Warner K. K., Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,351

Claims priority, application Japan, Apr. 10, 1980, 55-46175; Apr. 10, 1980, 55-47612[U]

Int. Cl.³ F16D *41/06*

U.S. Cl. 192—45 **19 Claims**



1. A unitary structure for a one-way clutch assembly adapted to be disposed between two relatively rotatable members so as to permit relative axial rotation between the two members in one direction but prevent relative axial rotation between the two members in the other direction, comprising a race formed with grooves at the periphery thereof, each groove being defined by a bottom and by first and second side walls extended in the direction of the depth of the groove and distant from each other in the peripheral direction of the race;

a pair of parallel annular cage plates positioned relative to said race to form radial side walls of the grooves;

a plurality of rollers received in the respective grooves;

a plurality of springs disposed in the respective grooves to bias the rollers toward the direction to prevent the relative rotation between said two members;

means for connecting the two parallel cage plates to fix the cage plates to each other and to the race in the axial direction;

means for preventing relative rotation between the race and the two cage plates; and

wherein said connecting means includes a plurality of axial members that extend from a peripheral portion of one of said annular cage plates and that engage the other of the annular cage plates.

4,415,073

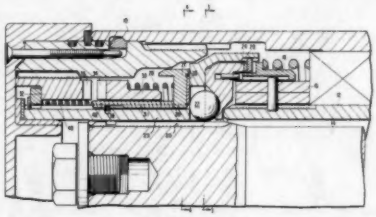
AUTOMATIC HUB CLUTCH

Chris A. Campbell, Janesville, Wis., and Robert B. Overbeek, Rochelle, Ill., assignors to Dana Corporation, Toledo, Ohio

Filed May 23, 1980, Ser. No. 152,635

Int. Cl.³ F16D *43/20*

U.S. Cl. 192—54 **15 Claims**



1. An automatic clutch for effecting a driving connection between a rotatable power shaft and a wheel hub, the combination comprising:

(a) a non-rotative cam member having a cam ramp;

(b) a control plate keyed to said power shaft and positioned adjacent to said cam member;

(c) a ball element interposed between said control plate and said cam ramp;

(d) a race washer cup and race washer arranged in concentric relation to said power shaft and engagable by said ball element;

(e) a gear affixed to said wheel hub in concentric relation to said power shaft;

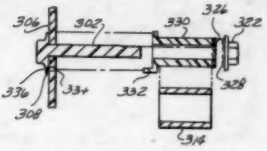
(f) a gear slidably mounted on said control plate with an engagement spring interposed between said race washer cup and said gear; and

(g) said control plate rotatably engaging said ball element upon the rotation of said shaft and moving said ball element up said ramp for engaging and moving said race washer cup axially of said shaft and into engagement with said sliding gear to force said sliding gear towards said fixed gear.

4,415,074
WORKPIECE SUPPORT BEARING FOR MODULAR CHUTING

John T. Leinenger, Pontiac, Mich., assignor to Modular Automation, Inc., Pontiac, Mich.

Continuation-in-part of Ser. No. 265,664, May 20, 1981, Pat. No. 4,381,834, and a continuation-in-part of Ser. No. 312,541, Oct. 19, 1981. This application Jan. 18, 1982, Ser. No. 340,370
Int. Cl.³ B65G 13/00
U.S. Cl. 193—37 4 Claims



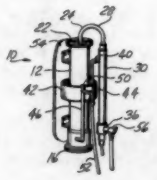
1. In a workpiece support bearing for modular chuting comprising a chute for passing the workpiece; a support engaging a first aperture formed in a chute wall; a low friction bearing member carried by the support; said bearing member including a flange extending radially outward abutting the chute wall; a bushing rotatingly carried by the bearing member; the invention comprising:

the support including a support flange extending radially outward abutting the chute wall, an aperture formed in said support flange, a second aperture formed in the chute wall aligned with the aperture formed in said support flange, and a projection extending longitudinally from the bearing member flange engaging the aperture formed in said support flange and the second aperture in the chute wall wherein rotation of the support and the bearing member is prevented.

4,415,075
WALL MOUNTED LIGHT WEIGHT AUTOMATIC WATER DISTILLER

Guy P. McNesky, Port St. Lucie, and E. Dale Rice, Tampa, both of Fla., assignors to General Molding, Inc., Tampa, Fla.

Filed Sep. 16, 1981, Ser. No. 302,883
Int. Cl.³ B01D 3/02
U.S. Cl. 202—177 8 Claims



1. A light-weight, compact and efficient distillation apparatus for periodically removing impurities from a quantity of water from a water supply by heating the water to be purified to form steam and condensing the steam to form distilled water, said distillation apparatus comprising:

a generally tubular vertically disposed member having a closed upper end and a closed lower end and forming a vaporization chamber therein;

a rim member extending about said tubular member at an intermediate level between said upper and lower end thereof and forming an annular rim trough for water around said tubular member, said rim trough having an opening permitting visual inspection of the level of water therein and further providing an overflow for said rim to limit the water level therein to a predetermined maximum level;

at least one aperture in said tubular member extending between said vaporization chamber and said rim trough for fluid communication therebetween such that said rim trough supplies water to said vaporization chamber and the water level in said vaporization chamber corresponds to the water level in said rim trough, said water in said rim trough forming a liquid seal between said vaporization chamber and the portion of said rim trough above said aperture such as to prevent the escape of steam from said vaporization chamber;

heating means disposed in said vaporization chamber below the level of said aperture such as to vaporize said water in said vaporization chamber;

a collector tube having a first end interconnected with said tubular member at a location above said aperture and communicating with said vaporization chamber and having a second end being reversely bent and extending downwardly therefrom such that vaporized water from said vaporization chamber is diverted therefrom along said collector tube;

a condenser tube having a larger diameter than said collector tube, said collector tube passing through the interior of said condenser tube and being affixed thereto, the ends of said condenser tube being closed off to define a sealed annular condensing chamber between said condenser tube and said collector tube;

an inlet to said condenser chamber;

first valve means for selectively regulating inflow from said water supply through said inlet into said condenser chamber such that the water from said water supply condenses the vaporized water in said collector tube;

a fill tube interconnecting said condenser chamber and said rim trough for fluid flow therebetween such that said fill tube supplies water to said rim trough and, thereby, to said vaporization chamber;

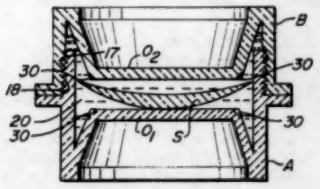
second valve means disposed along said fill tube and regulating the flow of water through said fill tube of said rim trough to provide a selectively controllable feed stock water supply for said vaporization chamber; and

an outlet at said second end of said collector tube as to provide a supply of said condensed water from collector tube.

4,415,076
SOFT CONTACT LENS CONTAINER

Charles E. Campbell, 2908 Elmwood Ct., Berkeley, Calif. 94705

Filed Nov. 23, 1981, Ser. No. 324,301
Int. Cl.³ A45C 11/04; B08B 3/04
U.S. Cl. 206—5.1 11 Claims



1. A soft contact lens container including in combination:

a fluid tight housing having opposed end walls and at least one side wall for confining there within an aqueous soft lens preservative solution, said side wall having a dimension larger than the diameter of said contact lens for confining side-to-side movement of a soft contact lens placed with said preservative solution interior of said container;

first and second opposed frustoconical indentations intruding interiorly of said container from a base portion of said frustoconical indentations in confronting relationship for confining therebetween a soft contact lens; and

optically transparent flat surfaces, in opposing juxtaposed

relation to said frustoconical indentations, for providing a view path through said aqueous solution, whereby it is possible to determine both base curve and power of contained soft contact lenses within said container as desired, and whereby air within said container is trapped between the side walls of said housing and the base portion of said frustoconical indentations.

4,415,077

MODULAR MERCHANDISE DISPLAY TOWER

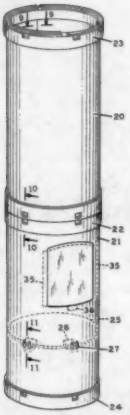
Thomas V. Murphy, Design Productions, P.O. Box 318, Oradell, N.J. 07649

Continuation-in-part of Ser. No. 238,376, Feb. 26, 1981, Pat. No. 4,377,231. This application Jun. 8, 1981, Ser. No. 271,566

The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.

Int. Cl.[3] **B65D** *3/24;* **A47F** *1/04, 3/14;* **B65D** *5/50*

U.S. Cl. 206—44 R **5 Claims**



1. A multi-story tower structure for the display and dispensing of articles of merchandise which comprises

(a) a plurality of cylindrical tower modules formed of sheet-like material having characteristics of substantial dimensional stability and at least limited flexibility,

(b) a connecting ring having opposed oppositely directed axially opening annular recesses of short axial length in relation to the axial length of said tower modules,

(c) a pair of said tower modules being received in said annular recesses to define a multi-story tower structure having a continuous tubular interior for the reception of display merchandise or the like,

(d) generally circular bottom-forming means removably supported in one of said tower modules,

(e) one of said tower modules having a merchandise access opening therein at a level above said bottom-forming means,

(f) a merchandise dispensing spout extending outward and upward from said access opening to enable removal of display merchandise from said structure,

(g) at least the lower one of said tower modules being formed of vertically fluted corrugated board, and

(h) an annularly recessed ring element mounted at the lower end of said lower tower module and forming a capping ring.

4,415,078

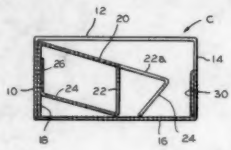
DISPLAY CARTON

Joseph J. Hart, Philadelphia, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 25, 1982, Ser. No. 361,750

Int. Cl.[3] **B65D** *5/50*

U.S. Cl. 206—45.14 **8 Claims**



1. A collapsible, display carton, for holding an article such as a tube, bottle, or can, said carton being formed of a unitary blank of foldable paperboard and comprising:

(a) pairs of opposed front and rear major side walls and first and second minor side walls foldably joined to each other to form an external tubular structure open at the ends;

(b) flap means for closing opposite ends of said structure;

(c) said front major side wall presenting, intermediate the ends of thereof, an opening for viewing the interior of said carton;

(d) an internal tubular structure positioned within said external tubular structure and secured to said first minor side wall;

(e) said internal tubular structure being spaced from said second minor side wall to define therewith and with said bottom wall a channel for receiving a packaged article;

(f) a major portion of said internal tubular structure being disposed under said front major side wall opening and including:

(i) a display panel foldably joined at it outer edge to a front portion of said first minor side wall and sloping toward said second minor side wall and said rear major side wall;

(ii) a central panel foldably joined at its front edge to the inner edge of said display panel and extending rearwardly toward said rear major side wall and in spaced parallel relation with said second minor side wall;

(iii) a back panel foldably joined at its inner edge to the rear edge of said central panel and sloping toward said first minor side wall panel and said front major side wall panel in spaced parallel relation with said display panel;

(iv) a glue flap foldably joined at its rear edge to the inner edge of said back panel and being secured to the inner side of said first minor side wall panel.

4,415,079

HOLDER FOR PHOTOGRAPHIC PRINTS

Peter Ackeret, Küsnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Mar. 12, 1982, Ser. No. 357,763

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1981, 3110058

Int. Cl.[3] **B65D** *25/00*

U.S. Cl. 206—45.34 **17 Claims**

1. A holder for accommodating a variable number of photographic prints comprising:

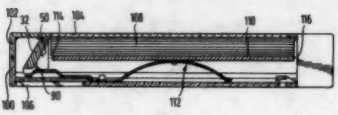
housing means, said housing means having a planar viewing window in first side thereof, said housing means having a hollow structure;

slide means for supporting a plurality of prints, said slide means being at least in part positioned within said housing means and being movable relative thereto, said slide means defining a control bar at a first end thereof, said

slide means having an opening in registration with prints carried thereby;

and

spring means positioned within and fastened to an interior surface of said housing means, said spring means including at least a first contact region which extends in the direction of movement of said slide means, said contact region extending through the opening in said slide means when



said slide means is fully inserted in said housing means and contacting the lowermost print to urge the print against the inwardly facing surface of said housing means window, said slide means control bar cooperating with said spring means to cause movement of the contact region thereof away from the viewing window upon movement of said slide means from the fully inserted position toward the withdrawn position.

4,415,080

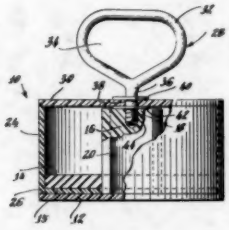
SLITTER BLADE CARRYING CASE

Donnie Romine, Rogersville, and Harry L. Woodard, Moulton, both of Ala., assignors to Champion International Corporation, Stamford, Conn.

Filed Jan. 22, 1982, Ser. No. 341,845

Int. Cl.³ B65D *85/02, 85/62, 25/28*

U.S. Cl. 206—303 **1 Claim**



1. A carrying case for slitter blades, said case comprising:

(a) a circular base;

(b) an upright post secured to said base and extending upwardly from the center thereof, said post including a threaded opening in a top surface thereof, and said post including a pair of diametrically opposed elongated grooves thereon complimentary to a slitter blade hub;

(c) a cylindrical hood adapted to overlie said base and post, said hood having a cylindrical side wall and a top wall closing one end of said cylindrical side wall; and

(d) a centrally located handle element rotatably mounted on said top wall of said hood, said handle element including a threaded shank portion extending through an opening in said hood top wall for threaded engagement with said threaded opening in said upright post, said handle element further comprising a pair of washers secured thereto on each side of said hood top wall of connect said handle element to said hood while permitting rotation of said handle element with respect to said hood.

4,415,081

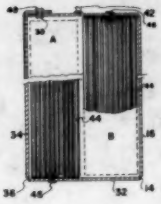
CARRIER ALBUM CASE

Antonio Goncalves, 379 N. 6th St., Newark, N.J. 07107

Filed Sep. 9, 1982, Ser. No. 416,215

Int. Cl.³ B65D *5/50, 85/57, 85/62*

U.S. Cl. 206—311 **9 Claims**



1. A carrier album case comprising:

a plurality of case members;

hinge members;

connecting said members for movement between an open position wherein said case members lie in generally coplanar relationship and a closed position with at least some of said case members folded on adjoining case members to form said case;

releasable fastening means fixed on said adjoining case members to secure same in said closed position;

a pair of stacks of envelopes secured at their middle to spaced apart case members and forming article-receiving holders at each end;

said stacks coming into contact in upside-down relationship when said case is closed.

4,415,082

MULTI-UNIT PACKAGE

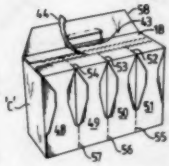
Claude Martin, Deols, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 26, 1981, Ser. No. 314,911

Claims priority, application United Kingdom, Oct. 28, 1980, 8034657; Jan. 22, 1981, 8101997

Int. Cl.³ B65D *65/00, 75/00*

U.S. Cl. 206—431 **13 Claims**



1. A package comprising a plurality of parallelepiped containers arranged in at least one row and accommodated within a wrapper of foldable sheet material adapted to cover at least portions of the tops, sides and bottoms of said containers and secured to at least portions of each of said containers, said wrapper comprising a top panel, a front panel hinged to said top panel along one side edge thereof and extending between the upper and lower ends of said containers, and a base panel hinged to said front panel remote from said top panel, said front panel being formed to provide at least one handle strip for each container, said handle strips being detachably connected to adjacent strips by means of frangible connections, each of said handle strips having its opposite ends integral with adjacent portions of said top panel and said base panel, said adjacent portions being secured to the top and bottom, respectively, of said container while said handle strip is left detached

from the underlying wall of said container, said adjacent portions being provided with tear lines in extension of said frangible connections between said handle strips so that individual containers may be detached from each other while said handle strip and said adjacent portions remain associated with said containers.

4,415,083

PACKING FOR A STACK OF ELECTRICAL AND/OR ELECTRONIC PARTS

Pieter Kemkers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1981, Ser. No. 308,965

Claims priority, application Netherlands, Nov. 4, 1980, 8006017

Int. Cl.[3] **B65D** *59/00, 85/00, 81/00*

U.S. Cl. 206—334 **4 Claims**

1. A package containing a stack of rectangular, plate-shaped parts such as electronic components to be subsequently utilized, which comprises an elongate tube having a rectangular internal cross section corresponding to that of said parts; a first stop member abutting against one end of said stack adjacent one extremity of the tube; and a second stop member abutting against the other end of said stack adjacent the other extremity of the tube, said second stop member having frictionally slidable in said tube with a clamp fit, said second stop member having a portion projecting beyond the other extremity of the tube; the arrangement of the two stop members with respect to the stack and the tube being such that, regardless of which extremity of the tube happens to come into contact with an object during transport of the tube, the position of the stack within the tube remains substantially unchanged; the projecting portion of the second stop member enabling said second stop member to be removed from the tube when it is desired to utilize the stacked parts.

4,415,084

BLISTER PACKAGE

Ivo J. Hauser, White Plains, N.Y., and Bruno Lutz, Stamford, Conn., assignors to The Nestle Company, Inc., White Plains, N.Y.

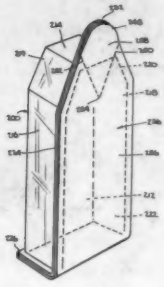
Filed Dec. 21, 1981, Ser. No. 332,499

Int. Cl.[3] **B65D** *75/36*

U.S. Cl. 206—461 **14 Claims**

1. A package comprising:

(a) a unitary blister defining a cavity and having an opening to said cavity extending over two faces of said blister, and having two flanges extending outwardly from the remainder of the blister, at the periphery of said opening, one of said flanges being disposed at one of said faces, the other one of said flanges being disposed at the other one of said faces, each such flange defining a planar support for said blister, the planes of said supports angularly intersecting one another; and



(b) a sheetlike cover closely overlying both of said flanges and overlying said opening.

4,415,085

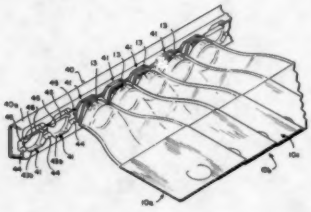
DRY PHARMACEUTICAL SYSTEM

John W. Clarke, Indianapolis, and Dale C. Harris, Fairland, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1981, Ser. No. 332,495

Int. Cl.[3] **B65D** *85/62;* **B65B** *57/02, 67/12;* **B65D** *1/02*

U.S. Cl. 206—526 **29 Claims**



11. A system for handling dry pharmaceuticals, comprising a plurality of containers,

each container being formed from two layers of flexible film and a port-forming member, said layers of flexible film being sealed at the periphery and to one end of the port-forming member to form a bag container for dry pharmaceuticals, said port-forming member having an inner surface forming a bore to provide access to the interior of the bag and a sealing surface for a container closure and having an exposed outer surface defining a projection, each of said containers having a closure sealed on the sealing surface of the port-forming member, and

a flexible plastic strip formed with a plurality of centrally located sites adapted to engage and retain the projection of the exposed end of the port-forming member of each of the plurality of containers,

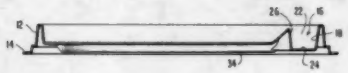
said system permitting the plurality of containers to be handled as an assembly.

4,415,086

INOCULUM TRAY

John T. Bennett, Jr., P.O. Box 155, 21131 Georgia Ave., Brookeville, Md. 20833

Filed Mar. 4, 1983, Ser. No. 472,369
Int. Cl.³ B65D 1/34, 6/04
U.S. Cl. 206—564 3 Claims



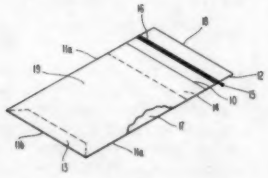
1. A liquid handling tray having an upper surface, a reservoir formed in the upper surface of said tray with a bottom surface spaced below said upper surface and a side wall having a plurality of apertures therein with the bottom of each aperture being at least at the level of the bottom surface of said reservoir and a plurality of grooves formed in the upper surface of said tray with the bottom surface thereof being disposed below the bottom surface of said reservoir whereby the liquid poured into said reservoir will be uniformly distributed through said apertures into said grooves.

4,415,087

LAMINATED PRESSURE SENSITIVE ADHESIVE STRIP FOR USE IN PLASTIC BAGS

William J. Clayton, Fairport, and William G. Outhouse, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,799
Int. Cl.³ B65D 65/40
U.S. Cl. 206—632 9 Claims



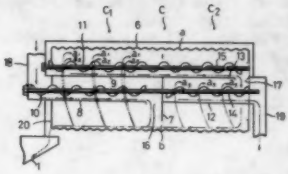
9. A resealable flexible bag comprising a first wall having a top edge, two sides and a bottom portion, a second wall having a top edge, two sides and a bottom portion, wherein said first wall and said second wall are sealingly attached along a major portion of said side edges and said bottom portions to form an open-topped bag body, said top edge of said first wall extending beyond said top edge of said second wall to define a closure flap, an adhesive system affixed to one of an outer surface of said second wall or said flap at a preselected distance from said opening, said adhesive system comprising a first layer of hot melt adhesive and a thin second layer of a liquid-based pressure sensitive adhesive applied over said first layer, said liquid-based pressure sensitive adhesive comprising a water-based acrylate or a solvent-based acrylate, said adhesive system being contained in a channel strip.

4,415,088

CYLINDER-TYPE ROTARY SORTING APPARATUS

Noriyuki Yano, Kochi; Satoru Yahashi, and Kanzo Shimazaki, both of Nangoku, all of Japan, assignors to Seirei Industry Company Limited, Okayama and Yanma Agricultural Equipment Company Limited, Osaka, both of, Japan

Filed Jul. 2, 1981, Ser. No. 279,727
Claims priority, application Japan, Dec. 18, 1980, 55-179965; Dec. 22, 1980, 55-182656; Dec. 22, 1980, 55-185224[U]
Int. Cl.³ B07B 13/04
U.S. Cl. 209—687 19 Claims



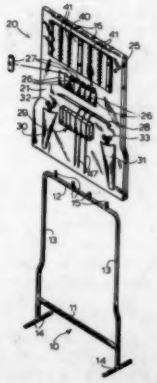
1. A cylinder-type rotary sorting apparatus including a sorter cylinder (6) substantially horizontally and rotably disposed which, on the inner periphery thereof, has a multiplicity of recesses (a), and receiving troughs provided in said sorter cylinder (6) for removal of sorted grains as scooped up by said recesses (a), wherein one half portion, left-hand side, of said sorter cylinder (6) constitutes a first-sorting segment (C1) and the other half portion, right-hand side, of said cylinder (6) constitutes a second sorting segment (C2) in which partially sorted grains as sorted out in said first sorting segment (C1) are re-sorted, and wherein means is provided for recycling unsorted grains from said second sorting segment (C2) to said first sorting segment (C1) for another cycle of sorting operation.

4,415,089

SUTURE AND SURGICAL ACCESSORY RACK

Rose Ruffa, R.D. 2 Farberhill Rd., Boonton Township, Morris County, N.J. 07005

Filed Nov. 3, 1981, Ser. No. 317,588
Int. Cl.³ A47F 7/00
U.S. Cl. 211—13 23 Claims



1. A suture and surgical accessory rack, comprising;
a disposable sterile member supportable in an upright manner, having a generally, vertically-disposed front panel, said front panel having secured thereto a multiplicity of first pockets, each configured and dimensioned for partial receipt therein of a suture-containing package, a needle count board

including at least one numbered row to which used needles may be secured, and a surgical tie holder including a generally, horizontally-disposed wall member projecting outwardly from said front panel having a multiplicity of parallel, vertically-extending slits formed therein in which surgical ties may be individually inserted, said front panel having a horizontally-disposed slit formed therethrough positioned above said wall member of said tie holder.

4,415,090

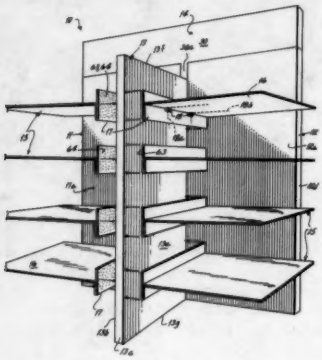
AISLE END MERCHANDISING DISPLAY DEVICE

Rafael T. Bustos, Atlanta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mich.

Filed May 21, 1981, Ser. No. 266,124

Int. Cl.³ A47F 7/00

U.S. Cl. 211—49 S **25 Claims**



1. A merchandise display device for displaying stacks of containers on the end of a store aisle, said display device comprising,

a pair of colinearly aligned wing panels located in a generally vertical plane,

a center panel, said center panel having one vertical edge located between and in juxtaposition to said wing panels, said center panel being located in a vertical plane which is perpendicular to said wing panels, and

a plurality of shelves secured to opposite sides of said center panel, each of said shelves including spring means interconnecting said shelf to said center panel and operable to bias said shelves into a position in which each shelf is located in a generally vertically extending attitude parallel to said center panel but is movable against the bias of said spring means into a generally horizontal load supporting plane.

4,415,091

ACCESSORIES FOR MOVABLE PARTITION SYSTEMS

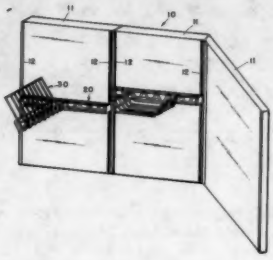
Douglas F. Wolff, Marshall, Mich., assignor to Wolff Wire Corporation, Ludington, Mich.

Filed Jun. 1, 1981, Ser. No. 269,417

Int. Cl.³ A47F 7/00

U.S. Cl. 211—50 **14 Claims**

1. An article support for use with a modular panel space divider system having support means along the vertical edges of each panel for detachably mounting accessory members, said article support including a rigid beam of a length to extend between said support means and having anchor means at each of its ends for detachably securing it to said support means in spaced and parallel relationship to the surface of a panel, said beam characterized by a pair of rigid elongated upper elements and a pair of rigid elongated lower elements, intermediate elements rigidly secured to and between said upper elements and between said lower elements and vertically spacing said upper elements from said lower elements, said intermediate elements forming a plurality of vertical pockets between said upper and lower elements opening through both the top and



bottom of said beam, said pockets being arranged in tandem along said beam for receiving the complementary-shaped hooks of an article supporting rack.

4,415,092

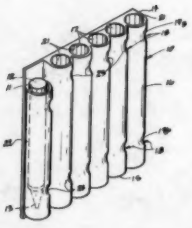
HOLDER FOR UNIFORMLY SHAPED ARTICLES

Thomas B. Boyer, 1926 Mullowney #49, Billings, Mont. 59102

Filed Jun. 1, 1981, Ser. No. 268,733

Int. Cl.³ A47F 7/00

U.S. Cl. 211—60 R **8 Claims**



1. A magazine for storing a plurality of elongated uniformly shaped articles and for permitting selective removal of one of the articles when replaced by another article, comprising:

a portable magazine housing having a plurality of separate storage compartments in which compartment is adapted to store only one article at a time therein;

biasing means associated with each compartment for releasably engaging each article in its respective compartment to prevent removal of the article from the compartment by gravity;

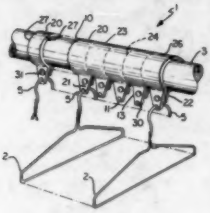
each elongated compartment having a longitudinal entrance opening and a spaced longitudinal exit opening in which spaced distance between the openings is greater than the normal length of the article to prevent the direct manual removal of the article from the compartment but to permit an unstored elongated article to be longitudinally inserted into one of the entrance openings and to be manually pushed into the compartment engaging and progressively axially forcing the article stored in the compartment longitudinally out through the exit opening as the unstored elongated article is pushed through the entrance opening into the compartment displacing and replacing the previously stored article.

4,415,093

GARMENT HANGER SPACING APPARATUS

Lucy J. Livingston, 9803 Colony Place, Kansas City, Mo. 66131

Filed Jul. 30, 1981, Ser. No. 288,471
Int. Cl.³ A47J *51/142*
U.S. Cl. 211—113 **5 Cl**



1. An apparatus for spacing garment hangers having suspension hooks on a garment-supporting rod, which comprises:

(a) a continuous elongated strip of flexible material having a first and a second outer margin positioned opposite with respect to each other, each of said outer margins having a plurality of longitudinally evenly spaced notches extending inwardly therefrom;

(b) a transverse tear line extending across said strip between a respective corresponding opposite pair of said notches;

(c) said strip comprising a plurality of juxtaposed, transverse strap members, each of said strap members having:

(1) a middle portion;

(2) a first end portion positioned adjacent said first outer margin and having a hook-receiving aperture therethrough for receiving a respective garment hanger suspension hook and a first clasp member aperture therethrough positioned inwardly of said hook-receiving aperture; and

(3) a second end portion positioned adjacent said second outer margin and having a second clasp member aperture therethrough;

(d) a plurality of first clasp members each positioned in a respective first clasp member aperture; and

(e) a plurality of second clasp members each positioned in a respective second clasp member aperture;

(f) said strip having an open flat position with a substantially planar configuration and a closed position with said strap middle portions substantially encircling said garment-supporting rod, said clasp member apertures aligned and each said second clasp member being attached to a respective first clasp member whereby respective strap member first and second end portions are connected in mutually opposed, downwardly-depending relationship from said garment-supporting rod.

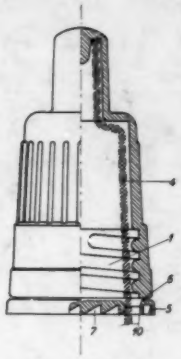
4,415,094

SAFETY CAP

Hans Bavnsfelt, Copenhagen, Denmark, assignor to Mogens Rued Nielsen ApS, Tappernoje, Denmark

Filed Jan. 11, 1982, Ser. No. 338,525
Claims priority, application Denmark, Jan. 27, 1981, 354/81
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **7 Claims**

1. A two part security cap of plastic or like material adapted to be mounted on a mouth of a container and constructed to provide indication of unauthorized opening, the two part security cap including a base subassembly to be mounted on the mouth of the container and a closure subassembly for mounting on the base subassembly respectively comprising a base collar member and a closure cap member each having a security ring at the bottom thereof connected to the associated base collar member and closure cap member by thin frangible bridges, the security ring of the closure subassembly and the base collar member of the base subassembly having interengaging formations restraining the same against relative movement whereby the frangible bridges interconnecting said security ring with its associated closure cap member are caused to fracture when the closure subassembly is removed from the



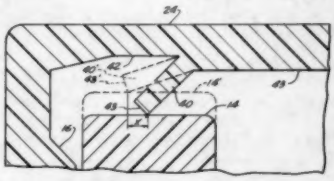
base subassembly, and the security ring of the base subassembly having means securing the same against rotation on the mouth of the container whereby forced removal of the base subassembly from the container produced fracture of the frangible bridges associated with the last mentioned security ring.

4,415,095

LID AND SEAL FOR JAR

Lothar L. Schweigert, 3609 Cody Rd., Sherman Oaks, Calif. 91403, and Stephen R. Paik, 821 Third Ave., Los Angeles, Calif. 90005

Filed Jan. 19, 1982, Ser. No. 340,603
Int. Cl.³ B65D *53/00*
U.S. Cl. 215—329 **2 Claims**



1. In a container and lid arrangement including and integral sealing gasket, the combination of:

a. a container having an access opening surrounded by a rim having an end engagement surface,

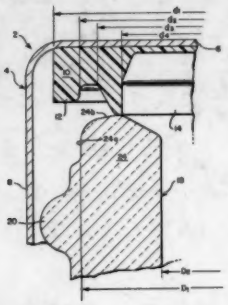
b. a closure for said container adapted to be screwed on and from said container and having a cover wall, and

c. a gasket comprising an annular wall at least partly of frusto conical shape mounted on said cover wall, having its smaller end adjacent said cover wall and its lower larger end having an annular lower edge adapted to engage said engageable surface of said container rim, said larger end of said gasket expanding outwardly along said engageable surface and in contact therewith, said gasket having sufficient stiffness to resist bending so that the inner surface of said gasket will not contact said engageable surface of said container rim.

4,415,096
CONTAINER CLOSURE HAVING AN IMPROVED LINER

Hidehiko Ohmi, Hirazuka, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,018
Claims priority, application Japan, Sep. 2, 1980, 55-120687
Int. Cl.³ B65D *53/00*
U.S. Cl. 215—343 7 Claims

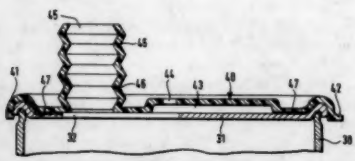


1. A container closure for a container having an upwardly facing annular surface forming an opening therein having an outer opening diameter and an inner opening diameter, said closure including a metal shell having a circular top surface and a substantially cylindrical skirt depending from the peripheral edge of the top surface, and a synthetic resin liner press-formed on the inside top surface of the shell; the improvement comprising in that said liner has at least first and second circular projecting rims on the surface thereof opposite said inside top surface of the shell and where the second rim has an inner end second rim diameter and an outer second rim diameter, in that the first rim is positioned radially outwardly of the second rim and has an inner circumferential surface adapted to engage an outer circumferential surface of a container when said closure is sealed to said container, in that said second rim has a height greater than a height of said first rim, in that said second inner rim diameter is greater than said inner opening diameter, and in that said second rim is adapted to engage the upwardly facing surface of said container during initial application of said liner to said container and when sealed to said container.

4,415,097
DRINKING AID FOR CONTAINERS OF BEVERAGES AND OTHER LIQUIDS

Wolfgang Meins, Alsterredder No. 44, D-2000 Hamburg 65, Fed. Rep. of Germany

Filed Jun. 23, 1981, Ser. No. 276,782
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023751
Int. Cl.³ B65D *25/48*
U.S. Cl. 220—90.4 11 Claims



1. A drinking aid for containers which are adapted to contain beverages and other liquids and are respectively provided with a tab opener associated with a container lid for creating a container opening therein, said aid comprising:

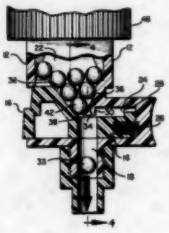
a cover of plastic synthetic material including an outer surface and a surface facing said container lid, said cover being releasably fastened to said container lid for sealingly covering the surface of said lid; and

a nipple-like mouthpiece, one end of which is connected to said cover in the region of said container opening, said cover including a vent in the vicinity of said mouthpiece, said mouthpiece having a longitudinal axis as well as being flexible and being foldable into the region of the outer surface of said cover, said mouthpiece being bendable about the longitudinal axis thereof, said mouthpiece having a non-circular cross-section, the smallest diameter of which is directed in the desired bending direction, that surface of said cover facing said container lid being provided with a recess for receiving said tab opener prior to use thereof for creating said container opening.

4,415,098
SINGLE BEAD DISPENSER

Tommy B. Haas, Antioch, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 15, 1981, Ser. No. 274,002
Int. Cl.³ B65H *3/60*
U.S. Cl. 221—202 7 Claims



1. A bead dispenser for gravity feed dispensing one bead at a time from a plurality of beads, said bead dispenser comprising:

a main body having a reservoir for said beads, an outlet below said reservoir, and a cavity intermediate the reservoir and outlet;

a slidable plunger adapted for insertion into said main body cavity, including an aperture through said plunger alignable with the main body outlet upon slidable insertion of the plunger to a bead dispensing position;

said reservoir including opposite interior surfaces angled inwardly convergent towards the cavity intermediate the reservoir and outlet, on both sides of the plunger with interior surfaces formed of different respective convergent angles;

said plunger and angled feed chute extending upwardly away from said plunger aperture;

a guide ramp on said main body projecting downwardly from the reservoir on a reservoir side opposite from said feed chute;

said guide ramp including an angled ramp face extending upwardly away from said aperture and opposite from said feed chute with said plunger in the bead dispensing position;

said angled feed chute and said opposing angled ramp face cooperating to individually feed said beads into said plunger aperture for dispensing;

said plunger and guide ramp adapted to substantially restrict all but one bead of said plurality of beads from being positioned immediately above said plunger aperture with the plunger in the bead dispensing position; and

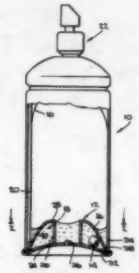
said feed chute is grooved to substantially conform to the size of a single bead.

4,415,099

APPARATUS FOR MAINTAINING FREE MOVEMENT OF A MIXING OBJECT IN A PRESSURIZED CONTAINER

Rafael R. Paris, Largo, Fla., assignor to Grow Group, Inc., New York, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,476
Int. Cl.³ B65D *35/22*
U.S. Cl. 222—94 **32 Claims**



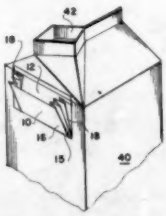
1. Apparatus for maintaining unimpeded movement of an object in a pressurized container having a flexible chamber for isolating a fluent product and a propellant which aids in dispensing of the product, the object being freely movably disposed in the product which is located outside the flexible chamber and adapted to mix the product upon shaking the container, the apparatus being structured to define in cooperation with a portion of the container a volume in which the object is movable and for allowing passage of the fluent product and the object into and out of the volume while substantially preventing entry of the flexible chamber into the volume.

4,415,100

DRIP CATCH RESERVOIR

Robert S. Hutchinson, P.O. Box 938, 710 County Rd., Pocahasset, Mass. 02559

Continuation-in-part of Ser. No. 137,181, Apr. 9, 1980, abandoned. This application Dec. 16, 1981, Ser. No. 331,043
Int. Cl.³ B65D *23/06*
U.S. Cl. 222—108 **3 Claims**



1. An expandable drip receptacle, comprising in combination:

sheet material including a flat section formed along its lower periphery in the shape of a foldable pocket open to its top, said pocket being of liquid-tight construction at least along its bottom and side sections,

said pocket including sides forming corrugated folded sections to enable the front section of said pocket to be folded towards and away from said flat section;

said flat section having a top section, a flat foldable along said top section for fastening against an external surface of a liquid container below and adjacent a pouring spout of said container;

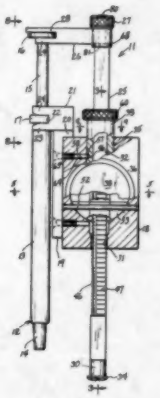
whereby drippings falling from said spout flow into said device.

4,415,101

INCREMENTAL LIQUID DISPENSING DEVICE

Justin J. Shapiro, 620 Hearst Ave., Berkeley, Calif. 94710, and Bruce R. MacDermott, 2835 Prince St., Berkeley, Calif. 94705

Filed Jan. 22, 1982, Ser. No. 341,649
Int. Cl.³ G01F *11/06*
U.S. Cl. 222—288 **13 Claims**



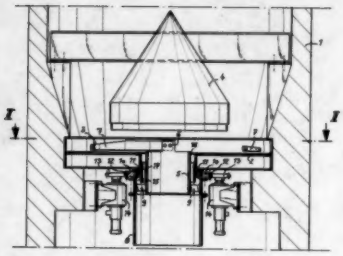
1. A liquid repetitive dispensing device comprising a main body, an elongated ratchet bar, means slidably and rotatably supporting said ratchet bar in said main body, means to operatively connect a liquid dispensing syringe between said main body and said ratchet bar, said ratchet bar having at least two angularly spaced longitudinal ratchet faces with ratchet teeth of different pitch, and actuating member movably connected to said main body, pawl means movably mounted in said main body and extending toward said ratchet bar, means operatively coupling said actuating member to said pawl means, means constraining said pawl means to drivingly engage said ratchet teeth responsive to movement of said actuating member, and means for selectively securing said ratchet bar in either of two rotated positions in said main body wherein said pawl means is operatively engageable with one ratchet face in a first rotated position of said ratchet bar and with the other ratchet face in a second rotated position in said main body, and wherein said means for selectively securing the ratchet bar includes bushing means slidably and non-rotatably receiving the ratchet bar and rotatably mounted in said main body, and means to fixedly clamp the bushing means to the main body in a selected rotated position of the bushing means.

4,415,102

DEVICE FOR EMPTYING A ROUND BULK-MATERIAL SILO

Lothar Teske, Hegelstr. 15, 5000 Cologne 90, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,565
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3107966
Int. Cl.³ B65G *65/48*
U.S. Cl. 222—411 12 Claims



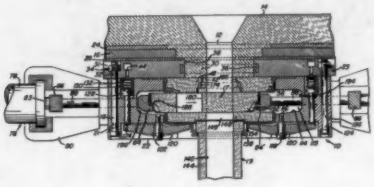
1. A device for emptying a vertical, round, bulk-material silo comprising an annular silo having a horizontal box-like enclosed bottom secured to a frame of the side and a centrally disposed bulk-material discharge opening in said bottom, a series of bucket wheel arms secured at one end above said bottom rotatable around a vertical axis and sweeping synchronously over said bottom to convey bulk material in the silo to the central discharge opening, a conical insert in the silo above the bucket wheel arms and disposed coaxially thereof, being larger in diameter at its base than the discharge opening and having its tip pointing upward, the bucket wheel arms being fastened to a first tubular chute arranged coaxially with respect to the discharge opening and rotatably supported below the bottom of the silo, motor drives fixed to opposite sides of the frame below the bottom of the silo for rotating the bucket wheel arms, the first chute having an upper opening terminating approximately flush with the upper side of the silo bottom with clearance from the soffit of the discharge opening, and the first chute being provided with bucket-wheel arm mounts extending above the bottom of the silo and a second tubular chute of larger inside diameter than the discharge opening and arranged coaxially of the first chute which supports the bucket wheel and into which second chute the first chute extends into the upper part of the second chute terminating just above a flanged connection to the lower part of the second chute, the second chute being firmly connected to the first chute by a plurality of struts distributed around the circumference of the first chute dimensioned and arranged to form an annular passage larger than the cross-section of the annular passage between the first chute and the edge portions of the discharge opening, the second chute being rotatably mounted on the silo bottom and the motor drives being arranged exteriorly of the second chute to rotate the same.

4,415,103

FULL THROTTLE VALVE AND METHOD OF TUBE AND GATE CHANGE

Earl P. Shapland, Sarasota, Fla., and Patrick D. King, Rantoul, Ill., assignors to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 73,588, Sep. 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 945,441, Sep. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 732,867, Oct. 15, 1976, abandoned. This application Jan. 19, 1981, Ser. No. 225,895
Int. Cl.³ B22D *37/00, 41/08*
U.S. Cl. 222—590 123 Claims



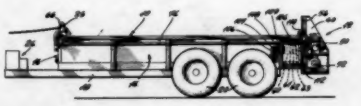
1. Valve apparatus for controlling the flow of liquid from the pour opening of a teeming vessel, comprising:
(a) a frame for connection to said vessel:
(b) gate supporting means extending longitudinally through said frame for slidably supporting blank and orificed refractory gates for movement along a first path of travel between a loading section adjacent one frame end, an operating section subjacent said vessel pour opening, and a gate discharge section adjacent the other frame end;
(c) first moving means for moving said gates sequentially along said gate supporting means between said frame sections; and
(d) second moving means operable independently of said first moving means and operative to move an orificed gate disposed in said operating section of said frame with its orifice in registry with said vessel opening along a second path of travel to vary the degree of registry of the gate orifice with respect to said vessel opening between a position of coaxial alignment therewith and a position out of registry therewith.

4,415,104

MATERIAL SPREADING IMPLEMENT

Laurent Boudreault, 187 rang Caron, La a la Croix, Lac St-Jean, P.Q., Canada G0W 1W0

Filed May 5, 1981, Ser. No. 260,676
Int. Cl.³ A01C *3/06*
U.S. Cl. 222—610 7 Claims



1. A material spreading implement, comprising:
a box-like structure defined by a front wall and opposite side walls, being opened at the rear end thereof;
a hydraulically operated beater assembly detachably mountable at said rear end so that said box-like structure may be freed of said beater assembly and used for other chores, said beater assembly including:
(a) a pair of upwardly extending spaced side frames;
(b) a rotary material beater mounted to said side frames and extending therebetween;

(c) a first hydraulic motor mounted to one of said side frames for operating said beater;
(d) a rotatable chain-wrapping member extending between said side frames below said beater;
(e) a second hydraulic motor mounted to one of said side frames for rotating said member;
(f) valve means mounted to one of said side frames and connected to said second hydraulic motor, said valve means including lever means disposed on said one side frame to be contacted by said gate, said lever means, when contacted, causing actuation of said second hydraulic motor and rotation of said chain-wrapping member in opposite direction to return said gate to the front wall of said box-like structure; and,
(g) hydraulic conduit means connected to said valve and motor means;

a push-off transverse gate movable from front to rear between said side walls in said box-like structure to push material into said rotary beater;

chain means connecting said gate to said chain-wrapping member of said beater assembly whereby said chain means are wrapped around said member as said gate moves to said rear end of said box-like structure;

hydraulic conduit means mounted on said box-like structure detachably connectable to the hydraulic conduit means of said beater assembly;

means detachably connectable to said valve means for actuating said valve means, said actuating means being mounted to one of said side walls of said box-like structure; and,

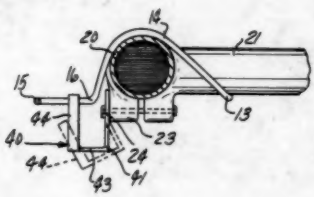
securing means for fixedly mounting said beater assembly to said rear end of said structure, said securing means being releasable to allow said beater assembly to be detached from said rear end of said structure with said push-off gate mounted to said beater assembly and said chain means wrapped on said chain-wrapping member.

4,415,105

ARTICLE CARRIER APPARATUS

W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 229,820, Jan. 30, 1981, abandoned. This application Nov. 3, 1981, Ser. No. 317,720
Int. Cl.³ B62J 7/04, 7/06
U.S. Cl. 224—41 **14 Claims**



10. In an article carrier for mounting on right-and-left projecting bar portions of stem-supported cross-bars of a cycle including a bent-wire carrier frame having a rigid central mounting loop with the respective reaches of the loop extending over the right and left bar portions and including longitudinally extending portions longtidinally spaced from the stem, the loop being in supporting engagement with the stem such that the bar portions provide cantilever support for the carrier frame,

the improvement comprising a stem-supportable latch member having a pair of elongate resilient retention fingers, the first end of each of the retention fingers being fixedly secured to the latch members, the second end of each of the retention fingers projecting outwardly therefrom, the fingers being maintained generally parallel to each other and extending in a direction generally perpendicular to the longitudinally extending portions of the reaches such that the second ends of the retention fingers may be flexibly biased until the reaches are flexibly received and maintained under compression in locking engagement with the retention fingers, thereby rigidly securing the reaches of the loop adjacent the stem front and preventing anti-cantilever movement of an article carrier thus mounted.

4,415,106

MAP HOLDER

Michael J. Connell, 2766 S. 13th St., and Ronald L. Swanson, 200 Richelieu Ave., both of Omaha, Nebr. 68108

Filed Jun. 19, 1981, Ser. No. 275,552
Int. Cl.³ A44C 5/00
U.S. Cl. 224—221 **3 Claims**

1. A map holder which is adaptable for use by a skier while skiing, comprising:

a pliable planar support element including a rectangular map supporting section, a male strap section, and a female strap section, said strap sections being attached to and extending outwardly from opposite sides of said map supporting section;

said map supporting section including an interior side having a plurality of spaced apart friction nipples formed thereon and a pair of bosses attached thereto and extending outwardly therefrom;

said male strap including an outwardly extending boss attached near its free end and a retaining loop attached intermediate said boss and said map supporting section;

said female strap including a plurality of perforations formed therein and spaced along a section of its length, said perforations adapted to matingly engage said boss on said male strap to secure said map holder on a limb of the skier;

a pliable planar translucent rectangular map enclosing element sealed along three of its outer edges to three outer edges of said map supporting section thereby forming a map pocket therebetween;

a flap attached to and extending from a fourth edge of said map enclosing element, said flap being disposed to fold over the interior side of said map supporting section, said flap including a plurality of spaced apart friction nipples formed thereon and a pair of perforations formed therein and adapted to matingly engage said pair of bosses on the interior side of said map supporting section to secure said flap in a closed position, thereby providing a water-resistant map pocket.

4,415,107

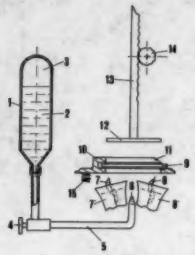
APPARATUS FOR INTRAOPERATIVE DIAGNOSIS

Beniamino Palmieri, Boito Street No. 45, Modena, Italy

Filed Feb. 20, 1981, Ser. No. 236,574
Claims priority, application Italy, Jun. 23, 1980, 22959 A/80
Int. Cl.³ B26F 3/00
U.S. Cl. 225—93.5 **8 Claims**

1. An apparatus for preparing a section of an organ for intraoperative diagnosis which comprises a refrigerating de-

vice which sprinkles a cryogenic liquid on the surface of a slide whereby the surface of the slide is cooled to at least −4° C. up to −8° C., at least one cooling fan which increases the evaporation of the cryogenic liquid to achieve the necessary hypothermia on the slide; an appositor which exerts a measurable and graduated pressure onto the section of the organ which has been interposed between said appositor and the slide at the time in which said section has reached a predetermined temperature.



4,415,108

ROLL FEED APPARATUS

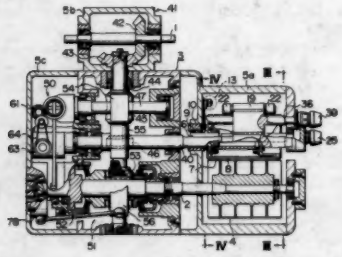
Heizaburou Katoh, Tokyo, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,798

Claims priority, application Japan, Oct. 30, 1980, 55-152684

Int. Cl.³ B65H *17/22*

U.S. Cl. 226—138 **17 Claims**



1. A roll feed apparatus comprising:

an intermittent motion mechanism adapted to translate the continuous rotation of an input shaft into the intermittent rotation in one direction of an output shaft;

a main roll rigidly fitted over said output shaft;

a roll housing;

a subroll shaft extended substantially in parallel with said output shaft;

eccentric means for rotatably supporting said subroll shaft in said roll housing;

a subroll rigidly supported on said subroll shaft and adapted to coact with said main roll to clamp and feed a workpiece therebetween, said subroll comprising

a rotation-transmission roll disposed at one axial end of and rigidly supported by said subroll shaft, said rotation transmission roll having a cylindrical peripheral surface for rolling contact with said main roll,

a workpiece-engaging roll surrounding said subroll shaft, and

means for flexibly supporting said workpiece-engaging roll from said rotation-transmission roll;

a first adjusting means operatively associated with said eccentric means for rotating said eccentric means to cause said subroll shaft to move toward or away from said output shaft, whereby the contact pressure between said main roll and said rotation-transmission roll can be adjusted;

a roll holder rotatably supporting said workpiece-engaging roll, said roll holder being supported by said roll housing; and

second adjusting means for moving said roll holder in unison with said workpiece-engaging roll to cause said workpiece-engaging roll to move toward or away from said main roll.

4,415,109

APPARATUS FOR THE TRANSPORT OF A LIGHT SENSITIVE MATERIAL IN A PHOTOTYPESETTING MACHINE

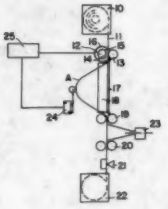
Joseph Pfister, Niederteufen, Del.X, assignor to H. Berthold, AG, Berlin, Fed. Rep. of Germany

Filed Jul. 16, 1981, Ser. No. 283,958

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1980, 3028238

Int. Cl.³ B65H *77/00, 17/22*

U.S. Cl. 226—181 **4 Claims**



1. Apparatus for inserting, guiding, and transporting recording material of different widths along a straight path extending from a storage cassette into a phototypesetting machine comprising:

a guide stop (**18**) positioned along one side of the path;

a pair of opposing, rotatable transport rollers (**12, 13**) lying across the path adjacent said guide stop at an angle to the path, said rollers receiving the material therebetween for moving the material along the path when rotated while providing a bias force urging the material against said guide stop, said roller pair being so formed as to disengage the material at at least one rotary position of the rollers to permit threading of the material between the rollers and to release the bias force to avoid buckling the material against said guide stop; and

drive means for rotating at least one of said rollers.

4,415,110

LP GAS-OPERATED IMPACT TOOL

C. LaMont Hunter, 715 N. University, Blackfoot, Id. 83221

Filed Aug. 17, 1981, Ser. No. 293,659

Int. Cl.³ B25C *1/08*

U.S. Cl. 227—10 **7 Claims**

1. A high speed impact tool comprising:

a housing,

a gas fueled internal combustion engine within said housing, said engine having first and second parallel cylinders each having first and second ends and each containing a piston longitudinally moveable within its respective cylinder;

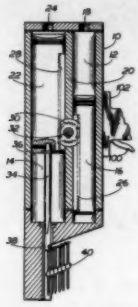
a pinion gear interconnecting opposite ends of parallel facing ranks on the exterior walls of pistons in said first and second cylinders;

fuel supply means for admitting a fuel air mixture into said first and second cylinders;

means for urging the piston in said first cylinder toward the first end of said first cylinder for compressing the fuel air mixture in said first cylinder end;

first electrical spark-generating means in the first end of said first cylinder; and

voltage generating means coupled to said spark-generating means and responsive to actuation by an external force for



generating a high electrical voltage output for firing said spark-generating means and said fuel air mixture to drive the piston in said first cylinder through said first cylinder toward the second end of said cylinder and the piston in said second first cylinder toward the first end of said second cylinder to thereby compress the fuel air mixture in said second cylinder.

4,415,111

STAPLING DEVICES

John C. McHarrie, 28 Hall Rd., Fulwood, Preston, Lancashire; Peter W. Hopcroft, 17 Balmoral Dr., Formby, Liverpool, Lancashire, and Donald B. Case, 'Alderley', 6 Church Ave., Penwortham, Preston, Lancashire, all of England

Filed Apr. 22, 1981, Ser. No. 256,613

Claims priority, application United Kingdom, Apr. 22, 1980, 8013230

Int. Cl.³ A61B *17/18*; B25C *5/02*

U.S. Cl. 227—19 **4 Claims**

1. An orthopaedic stapling device comprising:

a staple locator in the form of a tubular member having an inner surface narrowed towards a slot shape at one end thereof and an external surface tapered towards said one end to conform generally with said slot shape, said member having a pair of like parallel grooves extending in opposed relation longitudinally part-way along said inner surface from said one end, said member having a pair of bone penetrating pins connected thereto and projecting longitudinally therefrom at said one end for a short length relative to that of said grooves, said pairs of grooves and pins each being located respectively adjacent to the ends of said slot shape;

a bone penetrating staple having a bridge portion and a pair of leg portions projecting in slightly divergently splayed manner from the opposite ends of the former, said bridge portion having a length equal to the spacing between said locator member grooves, said leg portions having mutually like length not substantially greater than the length of said grooves, and said staple being substantially wholly-locatable within said locator member, bridge portion first, with said leg portions engaged under compression respectively in said grooves; and

a punch member longer than said tubular member and slidably locatable therein over substantially the whole length of the latter member from the other end thereof, and also slidably locatable in said locator member one end subtantially wholly over the length of said grooves.

4,415,112

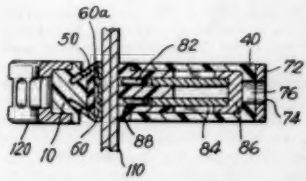
SURGICAL STAPLING ASSEMBLY HAVING RESILIENTLY MOUNTED ANVIL

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 27, 1981, Ser. No. 315,448

Int. Cl.³ A61B *17/04*

U.S. Cl. 227—19 **10 Claims**

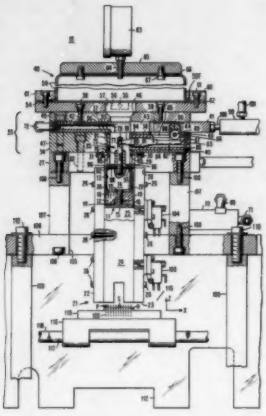


1. A surgical stapling assembly for use with an actuator assembly for simultaneously forming a plurality of surgical staples in body tissue comprising an anvil support member, resilient means mounted on the anvil support member, an anvil member mounted on the resilient means, a staple holding assembly, and means mounting the staple holding assembly relative to the anvil support member for movement into spaced relation to the anvil member to clamp tissue inserted therebetween, said staple holding assembly containing a plurality of surgical staples and including staple driving means for simultaneously driving all of the staples from the staple holding assembly through the clamped tissue and then into contact with the anvil member to crimp the staples, said anvil member being mounted on said resilient means so that when the stapling assembly is overloaded with tissue and the anvil member and staple holding assembly are moved into spaced relation, the anvil member is displaced, relative to the staple holding assembly, a distance sufficient to reduce pressure on the overloaded tissue, said displacement being such that the distance between the staple holding assembly and the displaced anvil member is less than the length of the legs of the uncrimped surgical staples.

4,415,113
IMPACT PINNER APPARATUS

David E. Houser, Apalachin; Harold Kohn, Endwell, and Gordon L. Williams, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 7, 1981, Ser. No. 223,191
Int. Cl.³ B27F 7/00
U.S. Cl. 227—130 4 Claims



1. Machine apparatus for pinning plural metallic pins to a cured substrate of ceramic particles, said pins being located in respective pre-formed openings of said substrate prior to being pinned thereto, said apparatus comprising:

tube-like chamber means,

piston means slidably operable in said chamber means in first and second opposite direction,

a magnetizable member affixed to said piston means,

pneumatic first means for driving said piston means in said first direction within said chamber means and away from a predetermined first position, said piston means simultaneously impacting said plural pins at a predetermined second position when being driven in said first direction,

pneumatic second means for returning said piston means in said second direction within said chamber means away from said second position and to said first position,

selective valve means for selectively interconnecting said first and second pneumatic member means to said chamber means,

air bearing means for laterally supporting said piston means relative to said chamber means at least during the movement of said piston means within said chamber means between said first and second positions,

said piston means impacting said pins with a predetermined impact force that places said pins in a temporary viscoelastic fluid state causing each of said pins to flow between said particles of said substrate in the region surrounding the particular hole in which each said pin is located, said fluid flow forming an integral extension in each of said pins in interlocking engaged relationship with the ceramic particles of said substrate region surrounding the particular hole in which each said pin is located upon return of each said pin and said fluid flow to its undisturbed solid state, and

delay means for delaying release of said piston means from said first position to said second position until said air pressure from said pneumatic first means becomes stabilized in said chamber means and in said air bearing means, said delay means further comprising:

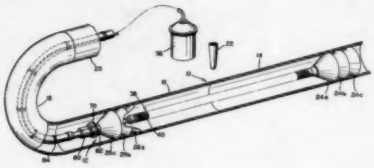
a permanent magnet maintaining said piston means in said first position by a magnetic force of attraction of said magnetizable member thereto, and

release means for interrupting said magnetic force of attraction when said air pressure from said pneumatic first means becomes stabilized in said chamber means.

4,415,114
PURGE GAS UNIT WITH CONES

Emerson J. Hallenbeck, 2934 Shoreland Ave., Toledo, Ohio 43611

Filed May 7, 1981, Ser. No. 261,577
Int. Cl.³ B23K 37/00
U.S. Cl. 228—57 10 Claims

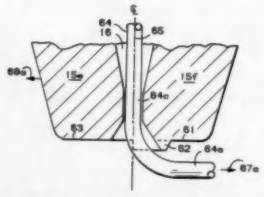


1. A purge gas unit for use with tubular members, portions of which are to be joined by welding performed by welding apparatus positioned at a predetermined location relative to the length of the tubular members, said purge gas unit comprising at least one first cone to be positioned on one side of the welding apparatus location and within the tubular members, at least one second cone to be positioned on the other side of the welding apparatus location and within the tubular members, a gas supply tube connected to the apex of the first cone and extending through the apex of the second cone, said gas supply tube having an opening between said first and second cones for emitting purge gas therefrom, means for supplying the purge gas under pressure to said gas supply tube upstream of said second cone, and a monitoring tube extending inside said gas supply tube to a point between said first and second cones and communicating with the space between said first and second cones.

4,415,115
BONDING MEANS AND METHOD

Kristi L. James, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 8, 1981, Ser. No. 271,444
Int. Cl.³ B23K 31/02
U.S. Cl. 228—170 11 Claims



10. A wire bonding and cutting capillary having an axial bore for receiving a wire to be bonded, said bore exiting said capillary at a first end which forms a bonding tip, comprising:

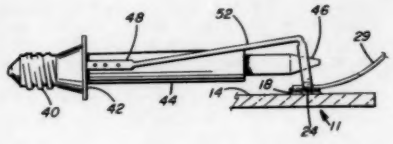
a first surface portion on said bonding tip adjacent to but not surrounding said bore and adapted for severing said wire when said capillary and said wire are oriented relatively so that said wire passes beneath said first surface portion; and

a second surface portion on said bonding tip, surrounding said bore and enclosing said first surface portion, located non-coplanar with respect to said first surface portion, and adapted for deforming said wire to produce bonds.

4,415,116
SOLDERING TOOL WITH RESILIENT HOLD-DOWN ATTACHMENT AND METHOD OF USING SAME

W. Jack Norton, Kittanning, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 6, 1981, Ser. No. 290,631
Int. Cl.³ B23K 3/02; H05B 3/06; B23K 31/02
U.S. Cl. 228—180 A 8 Claims

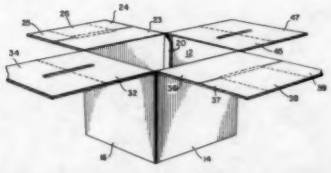


6. A method of soldering a braided lead wire to an elongated bus bar fused to a glass substrate comprising applying at least a portion of said braided lead wire over said elongated bus bar to overlie said bus bar along its length, applying a length of solder wire to the upper surface of said braided lead wire at a solder application point, applying a soldering tool having a heated soldering tip and a pair of hold-down means resiliently supported in flanking relation to said soldering tip so that said heated soldering tip engages said length of solder wire while said pair of hold-down means engage said braided lead wire at a pair of engagement points flanking said solder application point to melt said length of solder wire and form a liquid pool of solder, a portion of which permeates the braided lead wire and makes electrical contact through the braided lead wire with said bus bar, lifting said heated soldering tip from said liquid pool of solder while maintaining said hold-down means in engagement with said engagement points until said pool of liquid solder that has permeated through said braided lead wire and contacted said bus bar cools sufficiently to form a solid solder connection between said braided lead wire and said bus bar, and removing said soldering tool including said hold-down means from said engagement at said solder application point and said pair of engagement points.

4,415,117
CONTAINER WITH SELF LOCKING BOTTOM

William T. Pollard, Hinsdale, Ill., assignor to Westvaco Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,161
Int. Cl.³ B65D 5/10, 5/46
U.S. Cl. 229—39 R 10 Claims

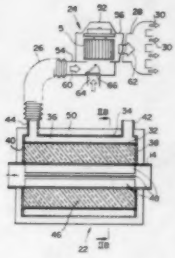


1. A container formed from a single blank of foldable material comprising a plurality of foldably connected side walls, self locking bottom flaps foldably connected to the bottom edges of said side walls and top closure flaps with integral handle portions and locking elements foldably connected to the top edges of said side walls, said self locking bottom flaps comprising opposed female locking flaps and opposed male locking flaps which are engaged and interlocked in an overlapping manner to produce a container bottom consisting of four thicknesses of the blank material, said top closure flaps comprising first and second pairs of opposed flaps, two of which have diagonal score lines which divide the flaps into handle portions and closure portions.

4,415,118
VEHICLE CABIN SPOT HEATER

Takuya Endo, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed May 12, 1981, Ser. No. 263,343
Claims priority, application Japan, May 13, 1980, 55-63070
Int. Cl.³ B60H 1/20
U.S. Cl. 237—12.3 A 8 Claims



1. A spot heater mounted on an engine-driven vehicle for preheating a vehicle cabin, comprising:

a regenerator mounted on an exhaust tube of said engine, said regenerator including a heat accumulating material substantially completely surrounding and intimately disposed about a portion of said exhaust tube to accumulate heat given off by exhaust gas passing through said exhaust tube, and casing means disposed coaxially about said heat accumulating material and said exhaust tube portion in a spaced, contact-free relationship with the material, to define an air conducting clearance extending continuously about and immediately adjacent said heat accumulating material for preheating the cabin,

said casing means further including an inner wall member located between the clearance and heat accumulating material to isolate said tube from the clearance;

inlet and outlet tubes in communication with the continuous clearance established within said casing means, said inlet and outlet tubes being spaced axially to said casing means, and

an air distributor unit including a housing with air inlet and outlet openings, a connecting duct connecting the outlet tube of the regenerator with the air inlet opening of said housing, an air carrying duct having one end connected to said air outlet opening of said housing and the other end exposed to a certain area of said vehicle cabin, and means for producing an air stream flowing from the inlet tube of the regenerator to the other end of said air carrying duct through said clearance, said connecting duct and said air carrying duct.

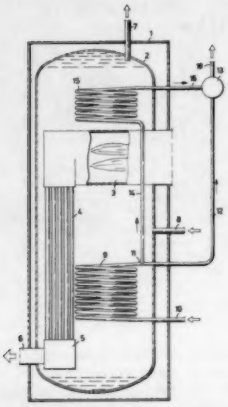
4,415,119
BOILER

Lars-Olof Borking, and Ragnar Bernstein, both of Fagersta, Sweden, assignors to Fagersta AB, Fagersta, Sweden

Continuation-in-part of Ser. No. 259,561, May 1, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 370,376
Claims priority, application Sweden, Apr. 1, 1981, 8102104
Int. Cl.³ F24D 3/08; F22B 5/00
U.S. Cl. 237—19 6 Claims

1. A boiler for a heating system and hot water supply system comprising a tank (2) for holding a heat-transfer medium, a combustion chamber (3) located within said tank in heat-conductive contact with the heat-transfer medium, a plurality of combustion-gas exhaust pipes (4) extending from the combus-

tion chamber downwardly through said tank, and a collecting chamber (5) connected to the lower end of said exhaust pipes having a discharge outlet (6); an outlet (7) for said heat-transfer medium at the top of said tank for passing the heat-transfer medium to the infeed line of the heating system and a return inlet (8) below said combustion chamber from the outfeed line of said heating system, and; a primary reservoir (9;20) located in said tank below said combustion chamber having a lower



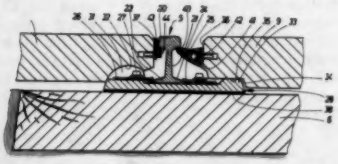
portion located beneath said return inlet and a reservoir inlet (10) connected to a supply of fresh water and a reservoir outlet comprising a first branch (12) extending to a mixer value (13) and a second branch (14) passing to a secondary reservoir (15;17), said secondary reservoir having an outlet (16;18) to said mixer value (13) arranged to supply fresh water having a higher temperature than that supplied from said first branch pipe (12), said mixer value being connected to said hot water supply system (19).

4,415,120

DEVICE FOR SLEEPERS FOR RAILWAY TRACKS

Stig Thim, Växjö, Sweden, assignor to A. Betong AB, Växjö, Sweden

Filed Jan. 27, 1981, Ser. No. 228,731
Claims priority, application Sweden, Jan. 30, 1980, 8000728
Int. Cl.³ E01C 9/04
U.S. Cl. 238—8 **6 Claims**



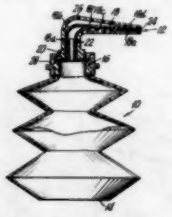
1. A device for an arrangement at a crossing between a road and railroad tracks, the arrangement being of the type having
a row of sleepers adapted to support the rails of the track, the sleepers being substantially perpendicular to the rails,
outer slabs positioned between the rails and the road,
an inner slab positioned between the rails,
said slabs having top surfaces substantially level with the top surfaces of the rails, said outer slabs having inner edges positioned proximate to the rails and outer edges positioned proximate to the road,
a pair of elongated support strips positioned adjacent to the road and adapted to support the outer edges of the outer slabs, and
first and second clamping devices for holding down the foot of each rail to said sleepers,
said device comprising:
a unitary support element including a substantially planer underside adapted to rest upon the topside of each sleeper, said sleeper having a substantially planer topside,
a groove formed in said element, said groove being adapted to support said foot of said each rail, said element having an inner portion and an outer portion, said inner portion being on the side of the groove toward the other rail and said outer portion being on the side of the groove toward the road,
a first heel positioned on said inner portion of said groove,
a second heel positioned on the outer side of said groove, said second heel having a partially cylindrical top surface the axis of which extends substantially parallel to said rail,
said first heel having a first section adapted to receive said first clamping device, said clamping device being adapted to hold down one side of said foot of said rail of said element,
said second heel having a second section adapted to receive said second clamping device, said second clamping device being adapted to hold down the other side of said foot of said rail to said element and to secured said element to said sleeper,
said first heel being adapted to support one edge of said inner slab,
said second heel being adapted to support the inner edge of said outer slab, said inner edge forming a partially cylindrical recess adapted to correspond with said partially cylindrical top surface of said second heel, whereby said partially cylindrical top surface of said element acts as a pivot for said outer slab during displacement in height between the edge of the road and said sleeper,
said support element being made of a resilient material.

4,415,121

VALVE FOR SPRAYING A MIST

Richard F. Berger, Huntington; Greg Pardes, New York, and Bernard R. Gerber, Jamaica, all of N.Y., assignors to The Reseal Corporation of America, New York, N.Y.

Filed Jun. 12, 1981, Ser. No. 273,023
Int. Cl.³ B05B 3/14
U.S. Cl. 239—229 **29 Claims**



1. A mist valve comprising wall means forming an axially elongated passageway having an inlet end arranged to receive the material to be sprayed as a mist and an outlet end from which the mist is sprayed, at least a portion of said wall means is flattened from the outlet end toward the inlet end, said wall means having an at-rest condition and a mist spraying condition and comprising a generally flat first wall and a generally flat second wall located opposite said first wall with said first and second walls disposed in contact in the at-rest condition of said wall means from said outlet end for at least a part of the length of said passageway toward said inlet end, at least one of said first and second walls having capillary-like channels therein extending in the elongated direction of and open to said

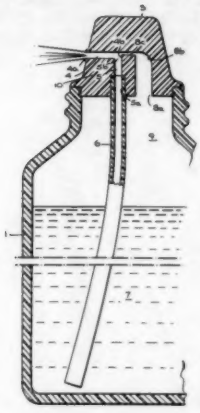
passageway with said channels extending from approximately said outlet end for a part of the length of said passageway disposed in contact in the at-rest condition of said wall means, at least a part of said wall means between said inlet end and said channels is flexible and vibrates when said passageway is in the mist spraying condition and material to be sprayed is forced therethrough, and the facing surfaces of said first and second walls are in sealing contact for a portion of the length of said passageway between the ends of said channels closer to said inlet end and said inlet of said wall means and form a seal closure preventing the flow of material through said passageway while said wall means is in the at-rest condition.

4,415,122

RIGHT-ANGLE SPRAY NOZZLE

Robert H. Laauwe, Franklin Lakes, N.J., assignor to Essex Chemical Corporation, Clifton, N.J.

Filed Jul. 14, 1981, Ser. No. 283,335
Int. Cl.³ B65D *1/32*
U.S. Cl. 239—327 **1 Claim**



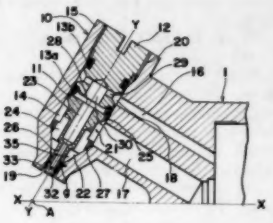
1. A spray-dispensing nozzle comprising a one-piece body having a side and a bottom and internally formed with a transverse first passage having a front end opening through said side; a longitudinal second passage having a bottom end opening from said bottom and a top end opening into the first passage without velocity-increasing restrictions so as to cause a solid column of liquid to rise with an exposed top surface in said first passage when the second passage's said bottom end is supplied with a flow of solid liquid, said first passage overlapping said top end of the second passage and having a back end adjacently behind the second passage's said top end, said body having a longitudinal third passage having a bottom end opening from said bottom and adapted to be supplied with a flow of air, said third passage opening into the first passage's said back end via a bend and a velocity-increasing orifice pointing axially forward into said first passage toward the latter's said front end and at a level spaced above the second passage's said top end and adapted to eject a high-velocity air jet which shears off liquid from said top surface of said solid column of liquid, when the bottom end of said third passage is supplied with said flow of air; said body having a longitudinal fourth passage having a bottom end opening from the body's said bottom and a top end opening into said first passage between its said front end and the top end of said second passage, said fourth passage being of small cross-section as compared to that of the other of said passages; and in which the front end of said first passage forms a counterbore of enlarged cross-section relative to that of the first passage and the fourth passage's said top end opens transversely into this counterbore and a fittment having a nozzle orifice is inserted in said recess, said counterbore forming an annular shoulder and said fittment having an inner end formed by vanes which curve around the fittment's said nozzle orifice and having interspaced circumferential ends, said vanes having inner sides substantially contacting said shoulder.

4,415,123

ATOMIZER NOZZLE ASSEMBLY

Hiroshi Ikeuchi, Ashiya, Japan, assignor to H. Ikeuchi & Co., Ltd., Osaka, Japan

Filed Jul. 7, 1981, Ser. No. 281,047
Claims priority, application Japan, Aug. 22, 1980, 55-116215
Int. Cl.³ B05B *7/06*
U.S. Cl. 239—425 **4 Claims**



1. An atomizing nozzle assembly comprising at least one pair of nozzle heads of identical construction, each of said nozzle heads comprising a generally elongated body having a longitudinal axis and having an interior space cylindrically symmetrical with respect to said longitudinal axis, said body having an end opening and a constricted discharge port at opposite ends of said body opening to said space in coaxial relation to said longitudinal axis, said body also having first and second supply ports communicated to said space on the one hand and adapted to be fluid-connected to respective sources of compressible and incompressible fluids on the other hand; an externally cylindrically symmetrical elongated nozzle tip member having first and second passage means defined therein and housed within said space in coaxial relation thereto, said tip member having opposite end portions respectively reduced and enlarged in diameter with the reduced diameter end portion situated adjacent said discharge port; and a plug member closing said end opening and held in contact with the enlarged diameter end portion of said tip member to hold said tip member in position steadily within said space, said first passage means communicating said first supply port to said discharge port and said second passage means communicating said second supply port to said discharge port, the nozzle heads of said at least one pair of nozzle heads being so supported relative to each other that the respective longitudinal axes of said nozzle heads can intersect with each other at an angle within the range of 70° to 160° with said discharge port of each of said nozzle heads facing towards the point of intersection of the respective longitudinal axes of said nozzle heads and spaced from said point of intersection a distance within the range of 3 to 15 mm;

said second passage means including a radially extending discharge passage opening from said reduced diameter end portion of said tip member into said discharge port, said reduced diameter end portion including a tip having a free end surface crossing said longitudinal axis substantially within said discharge port and a surface surrounding said longitudinal axis extending from the opening of said discharge passage to said free end surface, said surrounding surface having a circular cross-section perpendicular said longitudinal axis of non-increasing diameter along said longitudinal axis from said opening of said discharge passage to said free end surface, said surrounding surface including a frusto-conical surface terminating at said free end surface, whereby incompressible fluid flow through

said discharge passage into said discharge port does not form bulges of incompressible fluid on said surrounding surface.

4,415,124

METHOD FOR THE PRODUCTION OF MICROPOWDERS FROM CELLULOSE ETHERS OR CELLULOSE

Franz-Josef Carduck, Haan; Wilfried Rähse, Düsseldorf; Willi Wüst, Ratingen-Hösel, and Hans Pabel, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,379

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3038001

Int. Cl.[3] **B02C** *7/00, 19/06*

U.S. Cl. 241—28 **13 Claims**

1. A method for the production of micropowders from cellulose ethers or cellulose comprising:

(a) subjecting a cellulose ether or a cellulose having a fine-fiber, cottony or woolly structure to a consolidation or embrittlement sufficient whereby in one mill pass through a jet mill under standard conditions 98% by weight of the consolidated or embrittled material charged is recovered as a powder of less than 100μ, and

(b) subjecting the consolidated or embrittled material in the form of scales to a grinding step of one mill pass through a jet mill or a pinned disk mill or a baffle plate mill, producing a size reduction sufficient that a grain size distribution with at least 90% by weight of less than 125μ is attained, with a macromolecular degradation of from 2% to 26%.

4,415,125

APPARATUS FOR WINDING A THREAD

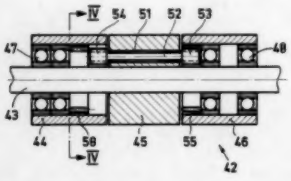
Peter Schwengeler, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Apr. 5, 1982, Ser. No. 365,512

Claims priority, application Switzerland, Apr. 24, 1981, 2691/81

Int. Cl.[3] **B65H** *54/46*

U.S. Cl. 242—18 DD **5 Claims**



1. An apparatus for winding a thread upon a rotatable, substantially conical bobbin tube into a bobbin package, comprising:

a rotatable friction drive drum;

said rotatable friction drive drum comprising a plurality of substantially cylindrical rotational elements;

a common driving shaft upon which there are mounted said rotational elements;

said rotatable friction drive drum contacting the bobbin tube and when thread is wound upon the bobbin tube the wound bobbin package along a generatrix;

said bobbin package and the friction drive drum rolling upon one another during the thread winding operation;

said plurality of cylindrical rotational elements comprising three of said rotational elements constituting a first element rigidly connected for rotation with said shaft and at least two further rotational elements;

one of said rotational elements constituting an intermediate element;

the remaining two rotational elements each being respectively arranged at an opposite end of the intermediate element;

a respective rotational bearing provided for each of said at least two remaining rotational elements of the friction drive drum and at each of which rotational bearings there is mounted a related one of said two remaining rotational elements so as to be supported to be freely rotatable upon said shaft; and

differential gearing means for mutually coupling said two remaining rotational elements with one another.

4,415,126

TRAVERSE MOTION FOR USE WITH APPARATUS FOR WINDING CONTINUOUS ELONGATE ELEMENTS

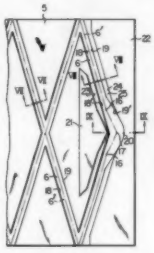
Kogi Nakazawa; Michio Sato; Shin Kasai; Yutaka Kawaguchi, and Toshiaki Kikuchi, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Dec. 18, 1981, Ser. No. 332,146

Claims priority, application Japan, Dec. 24, 1980, 55-182998

Int. Cl.[3] **B65H** *54/30*

U.S. Cl. 242—43 R **2 Claims**



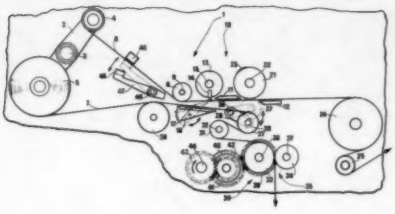
1. A traversing motion for use with apparatus for winding continuous elongate elements, said traversing motion comprising: a scroll cam means having a rotatable cylindrical body and an endless cam groove consisting of at least one right-handed and one left-handed helical groove provided on a surface of said cylindrical body, the grooves merging with each other at both ends thereof; and a second cam groove formed in superposed relationship with said endless cam groove at least in each of end portions around turning points thereof and having a greater lead angle than said endless cam groove over a predetermined distance adjacent each end thereof, and for guiding said elements, guide means provided with a cam follower to fit into said helical grooves of said scroll cam means for reciprocal movement of the guide means in parallel with the rotation axis of said cylindrical body of said scroll cam means, said cam follower being pivotably attached to said guide means and elongate in the direction of displacement along said helical grooves, said guide means having a further cam follower to fit into said second cam groove, said further cam follower being cylindrical and coaxial with said elongate cam follower, in which said elongate cam follower has opposite side surfaces defined by two similar partial cylindrical surfaces merging to each other at the ends thereof at an acute angle, and said endless cam groove is such that, considering a developed view thereof, the inner wall of the cam groove extends substantially linearly to each turning point while the outer wall of the cam groove extends parallel with said inner wall to a first point slightly before a point where the lead angle changes, tapers outwardly from said first point to a second point slightly before the associated turning point so as to gradually increase the distance from said inner wall, and merges at the second point into an arc around said turning point.

4,415,127

METHOD AND DEVICE FOR REPLACING A FIRST, NEARLY EMPTY REEL OF STRIP MATERIAL WITH A SECOND, NEW REEL

Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa' per Azioni, Bologna, Italy

Filed Oct. 5, 1981, Ser. No. 308,670
Claims priority, application Italy, Dec. 22, 1980, 3598 A/80
Int. Cl.³ B65H *19/18, 19/16*
U.S. Cl. 242—58.1 5 Claims



2. A device for replacing a first, nearly empty reel (4) of strip material with a second, new reel (5) on a user machine, the device comprising:

first and second reels (4, 5) containing a first and a second strip (6, 7) respectively;

a support element (2) for said first and second reels (4, 5), traction means (33, 34) for advancing said second strip (7) at a speed equal to that of said first strip (6);

first cutting means (14, 17) for effecting a partial cut simultaneously to the said two strips (6, 7) in overlying position;

clamping means (45, 46) adapted to cooperate with, and stop, a portion of said first strip (6) extending upstream from said partial cut;

adhesive applicator means (21) for applying an adhesive material (23) astride said partial cut;

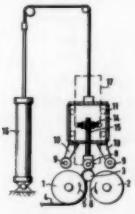
and, second cutting means (12) arranged downstream from said adhesive-applicator means (21) for cutting the said second strip (7) along the said partial cut.

4,415,128

RIDER ROLLS IN SUPPORT-ROLL WINDING MACHINES

Willi Heymanns, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 299,269
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035652
Int. Cl.³ B65H *17/08, 17/12*
U.S. Cl. 242—66 2 Claims



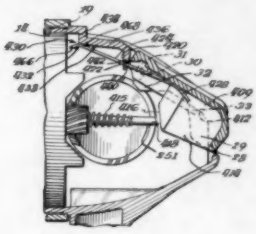
1. In an apparatus for winding a web on a roll supported by two driver rolls and including a rider roll bearing on the top of the web roll and mounted for vertical displacement in lateral guides, two further rider rolls symmetrically mounted on either side of the web roll and with their axes parallel thereto, and means for contacting the further rider rolls with the circumference of the web roll only after the latter has attained a predetermined diameter, all three rider rolls being mounted on a crossbeam which is vertically guided, the improvement wherein the first rider roll is mounted on the crossbeam for displacement relative thereto and the further rider rolls are mounted on the cross beam by means of rigid bearing brackets.

4,415,129

THUMB STOP RETENTION AND ANTI-RATTLE SPRING

Henry L. Neufeld, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 289,036, Jul. 31, 1981, abandoned. This application Dec. 9, 1982, Ser. No. 448,415
Int. Cl.³ A01K *89/01*
U.S. Cl. 242—84.2 A 5 Claims



1. In a spinning reel having a rotatable spinner head retained within a housing, which spinner head is displaceable axially by depressing a pivotable thumb button, and stop means associated with the thumb button which abut the reel housing to confine the rearward rotation of the button away from its depressed position, the improvement comprising:

outwardly extending pivots on the button and received in slotted openings in the housing, the button being pivotable about the pivots;

an elongate resilient spring member engageable with the housing and with the underside of the thumb button, said elongate resilient spring member is comprised of a pair of spaced, substantially parallel, elongate legs interconnected by a closed end, a portion of one of the legs being offset away from the other leg to define a substantially laterally extending edge; and

tab means associated with the housing and engageable with the legs of the elongate resilient member at an intermediate position thereon, the tab means including at least one aperture through which the leg of the elongate resilient member having the offset portion is extended, the laterally extending edge of the offset portion of the leg engaging the tab at the edge of the aperture to restrain longitudinal movement of the resilient member relative to the housing, the resilient member biases the stop means toward the reel housing and retains the pivots in the slotted openings.

4,415,130

MISSILE SYSTEM WITH ACCELERATION INDUCED OPERATIONAL ENERGY

John H. Staehlin, Lutherville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 12, 1981, Ser. No. 224,347
Int. Cl.³ F42B *15/00;* F41G *7/22*
U.S. Cl. 244—3.15 10 Claims

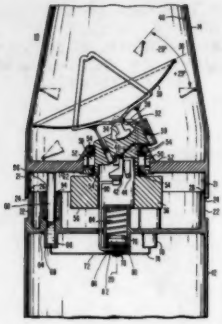
1. A missile system comprising:

a main support housing section having two ends oppositely disposed along a longitudinal axis of said missile, said housing section including a propulsion mechanism operative to effect thrust at one end thereof causing accelera-

tion of said missile at least in a direction along the longitudinal axis thereof;

a nose cone section slidably, mechanically interconnected to the other end, opposite said one end, of said housing section and operative to move with respect to said housing section under the induced acceleration of said missile;

a fluidic system operative to collect and store the energy resulting from the acceleration induced movement of said nose cone section with respect to said housing section;



at least one mechanism disposed on said missile and which requires energy for operation during the flight time of the missile; and

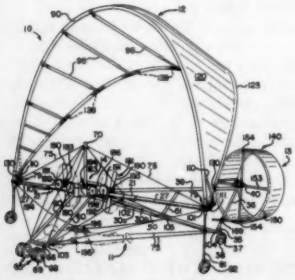
a regulating means operative to provide energy from said fluidic energy storage system to said at least one mechanism for operation thereof during the flight time of said missile.

4,415,131

ARC WING AIRCRAFT

William R. Bertelsen, Rock Island, and William D. Bertelsen, Neponset, both of Ill., assignors to Bertelsen Inc., Neponset, Ill.

Filed May 5, 1980, Ser. No. 146,636
Int. Cl.³ B64C *3/54, 9/00*
U.S. Cl. 244—13 **23 Claims**



1. An aircraft comprising

fuselage means forming the support structure of an aircraft,

airfoil means carried by said fuselage means and adapted to provide aerodynamic lift during flight of the aircraft,

said airfoil means forming a continuous wing surface of an arcuate configuration during flight,

said continuous wing surface being formed of a flexible, fabric-like, material assuming said configuration during flight,

said airfoil means extending upwardly from said fuselage means and having respective ends coupled thereto,

said wing surface forming an increasing chord length from said ends to the upper portion of said airfoil means,

said fuselage means includes a plurality of elongated fuselage members coupled to a rigid member to form a support structure having a skeletal frame construction,

a airfoil means including a rigid leading edge member to which said material is pivotally attached, and

said airfoil means further including a tensioned flexible trailing edge assuming the trailing edge configuration of said wing surface during flight,

said airfoil means further including a plurality of airfoil form retaining means for supporting and defining said chord length of said airfoil means,

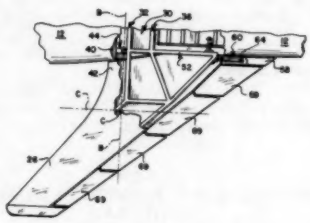
said airfoil form retaining means having means to selectively adjust said chord length at predetermined positions along the arcuate configuration of said airfoil means.

4,415,132

AIRCRAFT HAVING VARIABLE INCIDENCE FORWARD-SWEPT WING

Michael H. Shirk, Vandalia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1981, Ser. No. 324,913
Int. Cl.³ B64C *3/38*
U.S. Cl. 244—48 **6 Claims**



1. In an aircraft of the type having a fuselage, a pair of forward-swept wings, and a wing carry through extending transversely through said fuselage and outwardly therefrom to form an integral part of each of said wings thereby joining said wings together so as to form with said wings a unitary wing structure, the improvement comprising:

at least two hinge means, each located forwardly of said wing carry through adjacent a different one of said wings and interconnecting said fuselage and said wing carry through, for rotatably mounting said unitary wing structure via its wing carry through to said fuselage, each of said hinge means also being located on a spanwise axis intersecting aerodynamic centers of each of said wings such that an axis of rotation of said unitary wing structure defined by said hinge means is substantially collinear with said spanwise axis; and

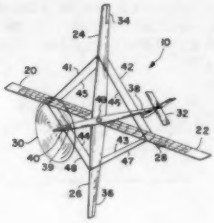
means attached to said fuselage rearwardly of said unitary wing structure, and extending between and interconnecting said fuselage and said wing structure, for selectively rotating said wing structure about said axis of rotation to vary the angle of incidence of said wing structure as a unit and therewith said wings with respect to said fuselage but without varying the angle of forward sweep of said wings with respect to said fuselage.

4,415,133

SOLAR POWERED AIRCRAFT

William H. Phillips, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 15, 1981, Ser. No. 263,829
Int. Cl.³ B64D 27/02
U.S. Cl. 244—53 R 10 Claims



1. An aircraft comprising:

airfoil means having surfaces normal to each other for sustaining free flight of the aircraft;

solar cells carried by at least one of said airfoil means surfaces for powering the flight of the aircraft;

control means for orienting said airfoil means normal to the path of the sun's rays; and

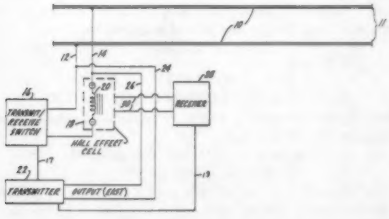
means for constantly maintaining said solar cells normal to the path of the sun's rays during an uninterrupted flight from at least sunrise to sunset.

4,415,134

HALL EFFECT TRACK CIRCUIT RECEIVING ELEMENT

H. James Wilson, La Grange, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 167,694, Jul. 11, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,618
Int. Cl.³ B61L 21/00
U.S. Cl. 246—34 CT 4 Claims



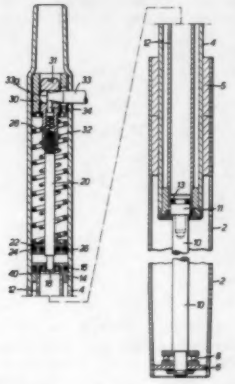
1. A railroad signal circuit including a transmitter and receiver having a common connection to the track rails at one end of a signal block, a transmit/receive switch connected to said transmitter and a code following element connected to said receiver and connected to said transmit/receive switch and transmitter, said code following element comprising a Hall effect cell whose output is connected to said receiver, said transmit/receive switch preventing signals from said transmitter being received by said receiver.

4,415,135

SUPPORT DEVICES FOR SWIVEL CHAIRS

John A. W. French, Milton Keynes, England, assignor to WIPAC Group Sales Limited, Buckingham, England

Filed Mar. 22, 1982, Ser. No. 360,677
Claims priority, application United Kingdom, Mar. 24, 1981, 8109104; Jun. 30, 1981, 8120162
Int. Cl.³ F16M 11/00
U.S. Cl. 248—161 9 Claims



1. A device for supporting a chair at a selected height, comprising a hydraulic cylinder arranged to support the chair, the cylinder being contractable to lower the chair under the weight of the chair occupant, a spring member acting to extend the cylinder to raise the chair when unoccupied, means defining two fluid-filled chambers in the cylinder, valve means separating the chambers, and manually-operated control means for selectively opening and closing the valve means, said fluid flowing between said chambers via the open valve means during adjusting expansion and contraction of the cylinder, and said valve means when closed blocking the fluid flow whereby to hydraulically lock the cylinder against expansion and contraction, each chamber including a portion immediately adjacent the valve means, said portions being axially spaced such that there is a substantially direct axial flow between the chambers substantially without reversal of the flow direction, one of said chamber being of smaller cross-sectional area than the other of said chambers, a plunger reciprocable within the cylinder and defining a boundary of said other chamber, said spring member acting between the plunger and the cylinder to bias the plunger in a sense to reduce the volume of the said other chamber, and the fluid flowing from said one chamber to said other chamber during contraction of the cylinder and causing the plunger to be displaced against the bias of said deformable spring member.

4,415,136

PEDESTAL FOR CONSOLES

Peter R. Knoll, Fountain Valley, Calif., assignor to Dentronix Systems, Inc., Santa Ana, Calif.

Filed May 12, 1981, Ser. No. 262,929
Int. Cl.³ F16M 11/14
U.S. Cl. 248—181 16 Claims

1. A pedestal for adjustably supporting, positioning and orienting display consoles which include a display face, comprising:

a base for being mounted upon a supporting structure;

a hollow, partially spherical journal for supporting the display console;

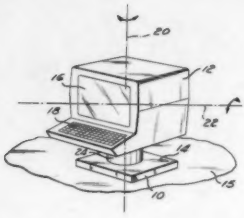
a first bearing on the upper edge of the base for supporting in

frictional sliding relationship the convex surface of the journal;

a second bearing positioned between the guide element and concave portion of the journal for supporting the guide element in frictional sliding relationship with the concave portion of the journal;

means for securing the first and second bearings in constant compression against the convex and concave surfaces respectively of the hollow, partially sperical journal;

the base, journal, guide element, first and second bearings and compression means being so disposed and constructed as to



permit the supported console to be tilted and pivoted thereon by movement against constant frictional force as the first and second bearings slide over the concave and convex journal surfaces, said friction being sufficient by reason of the compression applied to the first and second bearings to maintain the console at a selected position and orientation without additional means; said first and second bearing formed of a low friction, cold flowable self-lubricating polymer and said compression means comprising resilient means under compression within the Hooke's law range of said means to maintain the frictional sliding relationship between the first and second bearings and the journals.

4,415,137

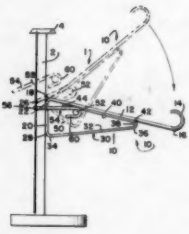
CANTILEVER ATTACHMENT

John C. Garves, 10 Post Office Rd., Silver Spring, Md. 20910

Filed Apr. 2, 1982, Ser. No. 364,591

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—629 **22 Claims**



1. Detachable cantilever apparatus for hanging objects at a distance from vertical posts comprising a cantilever having a substantially vertical base for lying against a vertical post, resilient means extending outward from the base beneath the cantilever, first attachment means connected to the resilient means remote from the base for cooperating with complementary second attachment means to connect the base and the cantilever to the vertical post, the resilient means urging the first attachment means outward away from the post, and second complementary attachment means, separable from the first attachment means and connectable thereto with a portion of the second complementary attachment means positioned on an opposite side of the post for cooperating with the first attachment means to capture and hold the base against the post.

4,415,138

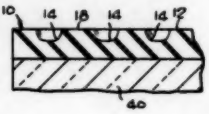
ELASTOMERIC VIDEODISC MOLD

Manfred H. Jarsen, Encino, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 905,837, May 15, 1978, abandoned, which is a division of Ser. No. 753,184, Dec. 22, 1976, Pat. No. 4,130,620, which is a division of Ser. No. 406,686, Oct. 15, 1973, abandoned. This application Aug. 8, 1982, Ser. No. 404,793

Int. Cl.³ B29C *1/14*; B29D *17/00*

U.S. Cl. 249—114 R **6 Claims**



1. A mold for use in forming at least the information layer of a videodisc, comprising:

a rigid plate member; and

a thin, disc-shaped, elastomeric body on the order of 14 mils thick bonded to a surface of said rigid plate and having an upper surface including a planar portion and a non-planar portion,

said planar portion of said upper surface being employed for establishing a substantially planar surface in the resulting molded videodisc suitable for reflecting light incident thereupon, and said non-planar portion of said upper surface being formed by a plurality of spaced discrete, curvilinear-shaped, discontinuous surface regions extending out of the plane of said planar portion of said first surface,

said upper surface carrying information in the form of a spiral-shaped track having a plurality of individual turns in the spiral, each of said turns being separated from an adjacent one of said turns by a planar portion of said upper surface,

said spiral-shaped track being formed by said curvilinear-shaped discontinuous surface regions, said regions being arranged in sequential order, and each of said discontinuous surface regions being separated from the next one of said discontinuous surface regions by a planar portion of said upper surface,

each of said discontinuous surface regions having a constant width in a radial direction on the order of 1 micron and a constant maximum dimension in a direction perpendicular to said surface on the order of 0.7 microns, the length of each discontinuity in the circumferential direction and the distance between adjacent discontinuities in the circumferential direction representing the stored information.

4,415,139

AUTOMATIC SLIDING GATE VALVE

P. Keith Potts, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,349

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—62 **2 Claims**

1. An automatic sliding gate valve adapted to be connected to the ingress or egress opening of a vibrating dryer or other structure operable under either vacuum or pressure, said sliding gate valve comprising:

a pair of parallelly spaced apart side walls;

a pair of outer plate members connected in spaced apart parallel relation at right angles to and by said pair of parallelly spaced apart side walls, each outer plate member defining therethrough an opening of predetermined size in coaxial alignment and coalignment with the opening through the other outer plate member and adapted to be in coaxial alignment with said ingress or egress opening

of said dryer or other structure when said gate valve is connected thereto;

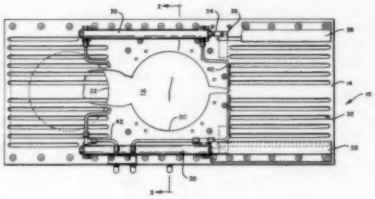
a flat slide plate member;

said pair of parallelly spaced apart side walls having opposed slotted guide rails adapted to slidably receive therebetween the opposite side edges of said flat slide plate member;

said flat slide plate member defining therethrough adjacent one end thereof an opening of predetermined size adapted to be in coaxial alignment with said outer plate member openings when slidably moved thereto;

pneumatic seal means bordering each of said outer plate member openings on the side of each of said outer plate members that is adjacent to one of the flat surfaces of said flat slide plate member and adapted when expanded to provide an airtight seal between each of said outer plate members and the adjacent flat surfaces of said flat slide plate member and around each of said outer plate member openings;

means for expanding and contracting said pneumatic seal means; and



means connected to said flat slide plate member and adapted to slidably move said flat slide plate member along said opposed slotted guide rails until the opening in said flat slide plate member is in said coaxial alignment with said outer plate member openings or the flat surface of said flat slide plate member extends over said latter openings, said means adapted to slidably move said flat slide plate member including a pair of fluid powered cylinders, each being operably connected adjacent one of said opposite side edges of said flat slide plate member on one side thereof, and each outer plate member defining through its opposite end portions along the length of the outer plate member a plurality of longitudinally extending slots each parallel to the others, and wherein each fluid powered cylinder is secured to the outer surface of one of said outer plate members and has means extending from one end of said fluid powered cylinder and through one of said longitudinally extending slots for said operable connection to said flat slide plate member.

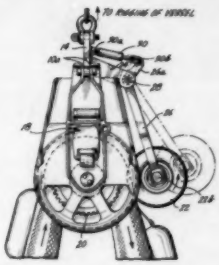
4,415,140

NET HAULING SHEAVE DEVICE WITH TAILING PRESSURE WHEEL

Kenneth J. Deering, Seattle, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.

Filed Mar. 18, 1982, Ser. No. 359,215
Int. Cl.³ A01K *73/06*
U.S. Cl. 254—371 **7 Claims**

1. Net hauling apparatus comprising a power-driven hauler sheave having an annular net-engaging groove therein, a support frame for said sheave comprising upright side members with means for rotatively supporting and driving said sheave on a generally horizontal axis between said side members, said frame further including means rigidly interconnecting said side members and further including hanger means on said frame having a substantially transversely central suspension means for pendulously suspending the apparatus by said hanger means, with clearance space provided beneath said hanger means for passage of a fishing net draped over the sheave and being advanced progressively upwardly to, over and downwardly from the sheave, said hanger means including a pivot mount substantially centered in the rotational plane of the hauler sheave at a location generally above the downturning side of the hauler sheave, a presser wheel formed to press the fishing net into the sheave groove in aid of net advancement by the sheave, and a generally upright presser wheel support arm



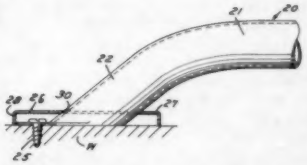
hingedly secured at its upper end to said pivot mount and carrying said presser wheel at its lower end in position to press the net into the sheave groove in a generally horizontal direction radially inwardly of the sheave on the dowturning side thereof, and force applying means interacting between said frame and said support arm yieldably urging said presser wheel against the net and thereby the net into the sheave groove.

4,415,141

WALL BAR

Torbett B. Guenther, Plymouth, Mich., assignor to C. D. Sparling Company, Plymouth, Mich.

Filed Jun. 7, 1982, Ser. No. 385,914
Int. Cl.³ E04F *11/18*
U.S. Cl. 256—69 **14 Claims**



1. A wall bar comprising

a length of tubular material,

the ends of said length extending at an angle to the adjacent portions,

said ends having integral flattened portions lying in a plane intersected by the inclined portions and defining an obtuse angle with the axis of the inclined portions,

said flattened portions being adapted to engage a wall and be attached thereto,

a cover plate for each end,

each said cover plate having an elongated opening which has a long axis having a dimension greater than the width of the flattened portion such that the cover plate may be telescoped over the flattened portion to mount the plate on the bar after the flattened portion has been formed and the plate can be placed in position over the flattened portion after the flattened portion has been attached to a wall.

4,415,142

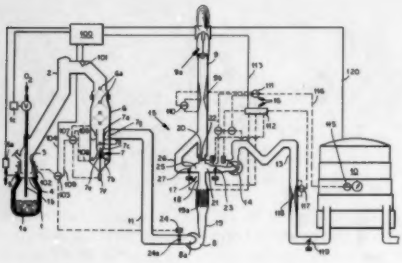
APPARATUS FOR HANDLING CONVERTER GAS

Karl-Rudolf Hegemann, Essen-Bergerhausen; Helmut Weissert, Bochum-Hiltrop, and Kurt Hinsken, Mülheim, all of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau Koml. Gasreinigungs- und Wasserruckkühlanlagen GmbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,500

Claims priority, application Fed. Rep. of Germany, Int. Cl.³ C21C *5/40*

U.S. Cl. 266—89 **4 Claims**



1. A gas handling plant for an oxygen blown steel-making converter comprising:

a gas collection hood adapted to communicate with the mouth of a steel-making converter for receiving converter gas therefrom;

a blower having an intake connected with said hood and an outlet for drawing said gas from said hood and forcing said gas from said outlet;

a T-connection having a first branch connected to said outlet, a second branch opposite said first branch, and a third branch;

a flaring stack connected to said second branch;

a storage vessel connected to said third branch by a duct provided with a check valve;

a throttle valve in said second branch;

an open/close two-position valve in said third branch; and

control means responsive to pressure in said storage vessel, pressure in said T-connection and pressure drop in said duct for controlling said throttle valve during initiation of gas storage to establish pressure balance across said two-position valve prior to the opening thereof upon the establishment of a predetermined set of gas storage conditions and for establishing equilibrium between the sum of said pressure drops and the pressure in said vessel with the pressure in said T-connection prior to closing of said two-position valve for flaring operation, said throttle valve being fully opened for flaring operation, said control means being responsive to the pressure in said vessel and forming a setpoint value for said throttle valve during gas storage and for forming a setpoint value of zero for flaring operation.

4,415,143

CONTINUOUS HARDENING DEVICE OF STEEL PLATE

Sadao Ebata, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP81/00356, § 371 Date Jul. 6, 1982, § 102(e) Date Jul. 6, 1982, PCT Pub. No. WO82/01894, PCT Pub. Date Jun. 10, 1982

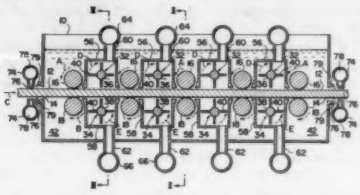
PCT Filed Nov. 27, 1981, Ser. No. 396,904

Claims priority, application Japan, Nov. 27, 1980, 55-167102

Int. Cl.³ C21D *1/64*

U.S. Cl. 266—112 **9 Claims**

1. A continuous hardening device of steel plate wherein steel plate is continuously cooled by cooling water, characterized in that said steel plate is passed through a water vessel into and out of which said cooling water is supplied and exhausted for maintaining a continuous circulation of said water, a plurality of rollers for moving the steel plate and a plurality of paddle



wheels located adjacent to the surface of the steel plate are provided in said water vessel, and said paddle wheels stir and cause cooling water to flow at a predetermined relative speed with respect to said steel plate.

4,415,144

PROCESS AND APPARATUS FOR REMOVING A LAYER OF FLUID ON TOP OF A BATH

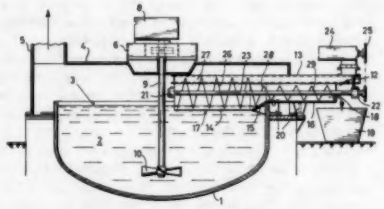
Peter Klotz, Stadland, and Henry Böttcher, Nordenham, both of Fed. Rep. of Germany, assignors to Preussag-Boliden-Blei GmbH

Filed Apr. 24, 1981, Ser. No. 257,230

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016160

Int. Cl.³ C22B *9/00*

U.S. Cl. 266—228 **7 Claims**

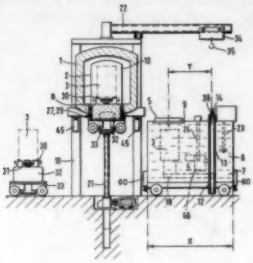


1. Apparatus for the removal of a slag layer floating on the surface of a melt, such as the removal of a slag layer from the surface of a lead melt during refining, comprising a melting vessel, and an axially elongated mechanical screw conveyor located within said vessel and extending into the slag layer, wherein the improvement comprises that said screw conveyor has a first axially extending stage located within said melting vessel and a second axially extending stage located outside of said melting vessel, a closed housing enclosing said first and second stages of said screw conveyor and having a stepped bottom, said stepped bottom comprises a lower stage located within said melting vessel and enclosing said first stage of said screw conveyor and an upper stage spaced upwardly from said lower stage and located outside of said melting vessel and enclosing said second stage of said screw conveyor, an inlet opening located in and extending in the axial direction of said lower stage of said housing, an outlet opening located in the bottom of the upper stage of said housing spaced outwardly from said lower stage, and said inlet opening arranged to be located within the slag layer so that said first stage of said screw conveyor removes the slag and conveys the slag to the outlet opening.

4,415,145
METAL CHARGE TREATMENT APPARATUS

Rainer Herdieckerhoff, Unna, Fed. Rep. of Germany, assignor to Firma Dr. Werner Herdieckerhoff, Unna, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 159,679, Jun. 16, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 412,019
Int. Cl.³ C21D *1/06*
U.S. Cl. 266—253 **20 Claims**



1. Apparatus for treating a metal charge, the apparatus comprising a furnace, the furnace housing a shroud within which the charge is heated, means for introducing the charge into the furnace, a container containing material for treating the charge, and separate charge-transfer means arranged within and supported by the container for transferring the charge from the furnace to the container, the shroud and the container being provided with alignable openings through which the heated charge can be transferred from the furnace to the container, wherein the furnace is a box furnace mounted on props, the props being sufficiently long as to permit the container to be positioned under the furnace, said opening in the shroud being positioned at the base of the furnace, and said opening in the container being positioned at the top of the container, said charge-introducing means being effective to lift the charge into the shroud through said opening in the base of the shroud, said charge transfer means comprising carrier means supported within the container beneath the charge and second support means positioned laterally of the charge and operable from outside the container, whereby vertical movement of the support means relative to the container causes vertical movement of the carrier means.

4,415,146
SUSPENSION STRUT ASSEMBLY

James R. Sitko, 5431 Vandewater, Waterford, Mich. 48095

Continuation of Ser. No. 231,265, Feb. 3, 1981, abandoned. This application Aug. 26, 1982, Ser. No. 411,619
Int. Cl.³ F16F *3/10*
U.S. Cl. 267—9 C **24 Claims**

1. An improved strut for use in a suspension system of a motor vehicle comprising:

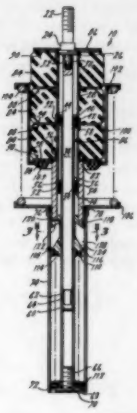
a plurality of rubber spring members positioned in a stacked relationship;

a first elongated tubular member extending through said stack of rubber spring members and having support means engaging one end of said stacked rubber spring members;

a second elongated tubular member disposed in substantially coaxial relationship with said first tubular member and being telescopically movable with respect thereto;

friction damping means; and

actuating means operative to urge said friction damping means into engagement with one of said first and second tubular members in response to an axially directed loading on said strut whereby said damping means may operate to create a friction drag resisting telescopic movement of said first and second tubular members, said rubber spring members being operative to resiliently support a portion of said motor vehicle to provide a desired ride frequency over substantially the full vehicle load range said actuating means comprising first and second relatively movable annular members surrounding one of said first and second tubular members and said damping means comprising a plurality of damping shoes moveably positioned between said first and second relatively movable members, compressive loading on said strut being operative to urge said first and second relatively movable members in a converging direction whereby said damping shoes are urged into engagement with said one of said first and second tubular members; and

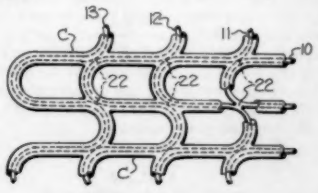


a third elongated tubular member positioned in telescopic substantially coaxial relationship with said first and second tubular members, one of said first and second relatively movable members engaging one end of said third elongated tubular member and the other end of said third elongated tubular member engaging the other end of said rubber spring members.

4,415,147
SEATING SPRING ASSEMBLY AND METHOD

Thomas S. Biscoe, Columbia, and Rodney S. Taylor, Folsom, both of Pa., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,145
Int. Cl.³ A47C *7/30*
U.S. Cl. 267—111 **8 Claims**



1. A seating spring assembly comprising

(A) a series of elongate sinuous spring wires, each of said spring wires touching each of its adjacent spring wires at frequent intervals along their lengths,

(B) frangible weld means provided at substantially the middle and at spaced apart additional touching locations

intermediate opposite ends of adjacent spring wires, said frangible weld means temporarily securing together the touching locations of adjacent spring wires, and

(C) a sleevelike plastic coating surrounding said spring wires and said frangible weld means, said plastic coating following the sinuosity of said spring wires and joining said spring wires together where said spring wires touch so that said spring wires, said frangible weld means, and said plastic coating comprise a unitary assembly, and whereby said frangible weld means is broken when said spring assembly is occupied by a person so that said plastic coating then constitutes the sole means holding said spring wires of said assembly together and the full flexibility and comfort of said seating spring assembly is retained.

4,415,148

RESILIENT MOUNTINGS FOR MACHINES OR MACHINE COMPONENTS, PARTICULARLY ENGINES IN MOTOR VEHICLES

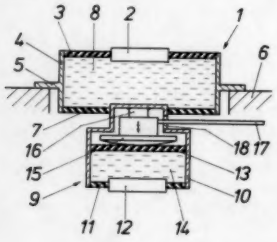
Christian Mair, Munich; Johannes Van den Boom, Kosching, and Heinz Hollerweger, Ingolstadt, all of Fed. Rep. of Germany, assignors to Boge GmbH, Eitorf and Audi NSU Auto Union AG, Neckarsulm, both of, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,728

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048888

Int. Cl.³ F16F *15/04*

U.S. Cl. 267—122 **9 Claims**



1. Apparatus for resiliently mounting supported members such as machines, machine components or rotary machinery to a supporting member, such as an internal combustion engine in a motor vehicle, comprising a mounting core member for coupling to the supported member, a support means for coupling to the supporting member, at least one spring means arranged between the mounting core member and the support means and coupled also for transmission of movement to an oscillatory damper mass such that oscillatory movement of said spring means excites oscillatory movement of said damper mass, said damper mass having a container filled with pressure fluid, a resilient diaphragm closing said container, a selectively adjustable pressure plate means disposed closely adjacent said diaphragm for variably contacting the diaphragm and varying its spring rate by varying the free area of the diaphragm, and means for selectively adjusting said pressure plate means so as to vary the damping action of said damper mass on said spring means and mounting core member.

4,415,149

PORTABLE WORKBENCH

Spencer C. Rees, Sugar Grove, Ill., assignor to Wen Products, Inc., Chicago, Ill.

Filed Jun. 25, 1981, Ser. No. 277,255

Int. Cl.³ B43L *5/00*; **B25B** *1/10*

U.S. Cl. 269—88 **8 Claims**

1. A portable workbench comprising:

a plurality of spaced legs,

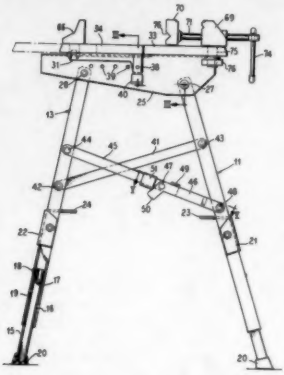
support means extending between said legs,

a pair of beams extending laterally across said support means and providing a work surface therefor,

adjustment means cooperating between said pair of beams and said support means to permit said beams to be positioned at a plurality of predetermined spacings relative to each other, each of said beams having a plurality of spaced vertical axis apertures extending therethrough,

struts interconnecting the two front legs with the two rear legs,

linkage means interconnecting said struts and permitting tilting of said work surface downwardly into a position such that said work surface is disposed angularly downwardly,



releasable lock means comprising a slidable sleeve for locking said linkage means in said position,

a vise member having a mounting shaft extending therefrom, said mounting shaft being proportioned to be received through one of said vertical apertures, said vise member further including:

a stationary jaw,

a movable jaw, p0 screw means extending between said stationary jaw and said movable jaw for moving said movable jaw toward and away from said stationary jaw,

said stationary jaw and said movable jaw having confronting planar faces arranged to clamp a workpiece therebetween.

4,415,150

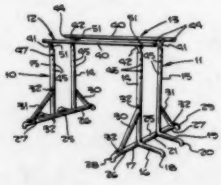
PORTABLE KNOCK-DOWN PARALLEL BAR EXERCISE FIXTURE

Franco S. Iezza, Los Angeles, Calif., assignor to J. Daniel Scherling, Montrose, Calif.

Filed Aug. 5, 1981, Ser. No. 290,236

Int. Cl.³ A63B *3/00*

U.S. Cl. 272—63 **8 Claims**



1. A relatively lightweight demountable gymnastic bar set for mounting on a horizontal supporting surface, said bar set comprising two identical end assemblies and at least one bar assembly, each end assembly comprising three tubular elements forming respectively a vertically disposed tubular stationary post, a tubular transverse beam having at each end a laterally outwardly disposed section extending beyond the

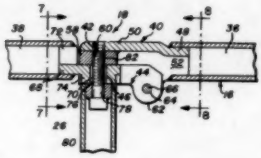
respective post and a diagonal bracing between the stationary post and the beam, the stationary post having a tubular section extending when in assembled condition transversely endwardly of said bar set, said bar assembly comprising an elongated tubular bar, a pair of identical tubular extension posts of the bar rigidly anchored to the bar at locations adjacent respective ends of the bar and in right angular relationship to the bar, each extension post being adapted to telescopingly engage a respective one of said stationary posts when the bar set is in assembled condition for use.

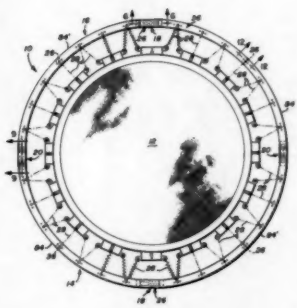
4,415,151

COLLAPSIBLE REBOUND EXERCISE DEVICE

Kenneth M. Daniels, 125 Roberta Dr., Woodside, Calif. 94062

Filed Mar. 1, 1982, Ser. No. 353,689
Int. Cl.³ A63B 5/18
U.S. Cl. 272—65 **10 Claims**





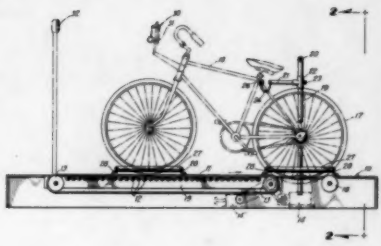
1. A collapsible rebound exercise apparatus comprising:
mat means for providing a resilient, flexible exercise surface;
frame means for supporting said mat means and including an open framework having first and second portions which are mirror images of each other and which are joined together by first and second hinge means that allow said framework to be folded along an axis of symmetry from an open configuration lying in a plane defined by said framework to a folded configuration wherein said second portion is disposed in overlying relationship with said first portion, each said hinge means including;
a first bracket affixed to one of said first and second portions and provided with a hole, and
a second bracket provided with a bore and affixed to the other of said first and second portions in opposed relationship with and pivotally attached to said first bracket, said first bracket and said second bracket being pivotal relative to one another about said axis of symmetry; and
support means affixed to said frame means for positioning said frame means above a supporting surface when said frame means is in said open configuration, said support means including bolt means extending therefrom in such a manner as to pass through said holes and into said bores to lock said hinges and restrain said frame means from folding.

4,415,152

BICYCLE TRAINING AND EXERCISE DEVICE

Sebie B. Smith, 1252 Peachtree St., Montgomery, Ala. 36106

Filed Aug. 27, 1981, Ser. No. 296,984
Int. Cl.³ A63B 69/16, 23/06
U.S. Cl. 272—73 **4 Claims**

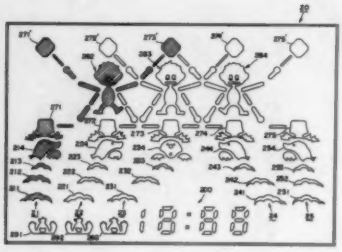


1. A bicycle rider training device also adapted for use as an exerciser for walkers or joggers comprising a low elevation level base, a level moving beltway on the base extending lengthwise of the base for a major portion of the length of the base, said beltway comprising an endless belt having a top run substantially flush with the top of the base, a series of spaced transverse axis support rollers for said upper run preventing it from sagging, a pair of forward and rear guide rolls engaging opposite ends of the endless belt, power means to drive the rear drive roll in a direction causing movement of the top run of the belt toward the rear of said base, a transverse axis idler roll on the base near its rear end and spaced rearwardly of and being substantially at the elevation of the rear guide roll for the endless belt, whereby the rear wheel of a conventional bicycle may be cradled on the idler roll and the rear of the endless belt as it passes around said rear guide roll for the belt, forward and rear pairs of laterally spaced parallel horizontal longitudinal axis bicycle wheel restraint rollers mounted on said base, said wheel restraint rollers all being at one elevation slightly above the level of the top of the base and top run of the endless belt, the rollers of each pair being disposed adjacent to and parallel to the opposite longitudinal edges of the belt to prevent the wheels of a bicycle from leaving the lateral confines of the belt, the rear pair of wheel restraint rollers being disposed immediately above the rear guide roll for the belt and said rear idler roll, the lengths of the wheel restraint rollers in said pairs and the longitudinal spacing of said pairs enabling all sizes of conventional bicycles to have their front and rear wheels placed between the forward and rear pairs of restraint rollers, an upright inverted U-shaped substantially rigid frame including side vertical bars and a top transverse bar disposed substantially midway between the rear idler roll and the rear guide roll for said belt, said substantially vertical bars being anchored to said base at points spaced laterally outwardly of the side longitudinal edges of the endless belt, said top transverse bar being at a sufficient elevation above the base to form a convenient hand grip for a walker or jogger whose feet are placed on the top run of said belt, a pair of comparatively short horizontal longitudinal arms on the vertical bars projecting forwardly thereof, coupling carrying said arms and being adjustable and lockable at desired elevations on the vertical bars so that the heights of said arms may be varied, a clamp plate adapted for attachment removably to the frame of a bicycle near and below the seat thereof, and a pair of equal length flexible substantially non-stretchable restraint elements connected between opposite ends of said clamp plate and said adjustable arms, whereby lateral tilting of a bicycle is restrained within safe limits during use of the device.

4,415,153
FIGURE DISPLAYING GAME APPARATUS

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Jun. 15, 1981, Ser. No. 273,954
Claims priority, application Japan, Jun. 19, 1980, 55-83776
Int. Cl.[3] A63F 9/00
U.S. Cl. 273—1 GC 16 Claims



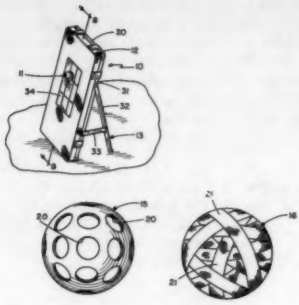
1. A figure displaying electronic game apparatus, comprising display means including at least a first symbol displaying region and a second symbol displaying region, said first symbol displaying region having a plurality of first kind symbol segments operable for display, said second symbol displaying region having a plurality of second kind symbol segments operable for display independently of said first kind symbol segments, operating means responsive to operation by a player for selecting at least one of said plurality of first kind symbol segments to be driven for display, first display driving means responsive to operation of said operating means for selectively driving for display said first kind symbol segments, display driving signal generating means for generating signals for driving for display said second kind symbol segements for automatically and sequentially changing the display state of said second kind symbol segments, second display driving means responsive to said display driving signals for driving for display automatically and sequentially at least one out of said plurality of second kind symbol segments, and display state determining means responsive to said display driving signals for said first and second kind symbol segments for determining that said display state of said first kind symbol segments contained in said first symbol displaying region and movable along a plurality of paths, at least one path intersecting said first direction line in which at least some of said first kind symbol segments are arranged, said apparatus further comprising game mode selecting means for selecting a first game mode for playing a game using all of the paths out of said plurality of paths of second kind symbol segments, and a second game mode for playing a game using a predetermined smaller number of paths of said plurality of paths of second kind symbol segments, and disabling means responsive to selection of said second game mode by said game mode selecting means for acting upon said second display driving means for disabling the driving for display of a predetermined number of paths of said plurality of paths of second kind symbols segments.

4,415,154
BALL AND TARGET

Gerald J. Engelhardt, 312 Blackberry La., Yorkville, Ill. 60560

Filed Feb. 25, 1981, Ser. No. 238,147
Int. Cl.[3] A63B 69/00, 39/06
U.S. Cl. 273—26 A 8 Claims

1. A practice ball and a ball target for use with said ball comprising a hollow spherical plastic ball body having openings therethrough, a covering on the surface of said sphere for enclosing and strengthening said sphere as a ball, and a target for receiving said ball, said covering having a resilient inner layer adhered to said sphere substantially uniformly to and over the outer surface of said sphere for resiliently reinforcing

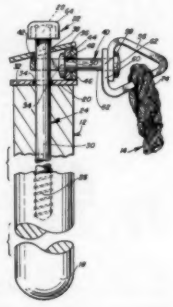


said sphere, and an outer layer for providing a ball surface to contain said resilient reinforcing inner layer and said sphere.

4,415,155
BATTING PRACTICE APPARATUS

Noel Goudreau, Bourbonnais; Nick Colevris, Bradley, and Carl Southard, Bourbonnais, all of Ill., assignors to Trico Products, Incorporated, Bradley, Ill.

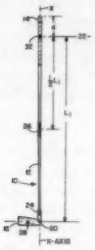
Filed Jul. 23, 1981, Ser. No. 285,960
Int. Cl.[3] A63B 69/40
U.S. Cl. 273—26 E 1 Claim



1. A batting practice apparatus comprising; an elongated cylindrical rod being adapted to be gripped, said rod having a circular cross section along its length, an axle fixed to one end of the rod, said axle being substantially parallel to the axis of the rod, a wear plate movably mounted on the axle adjacent to the one end of the rod, said wear plate having a circular outer periphery and having a diameter greater than the diameter of the rod, an upper plate movably mounted on the axle, said upper plate having a circular outer periphery and having a diameter substantially equal to the diameter of the wear plate, said axle having an enlarged portion on its free end to retain the upper plate, a swivel rotatably mounted on the axle between the wear plate and the upper plate, said swivel having an inner collar rotatably receiving the axle, a portion of the inner collar engageable with the wear plate and the upper plate, a swivel stud rotatably mounted in the inner collar, an outer collar rotatably connected to the swivel stud, a braided polypropylene hollow rope having a closed loop positioned in the outer collar, a solid core ball having a radial aperture and an enlarged aperture aligned with the radial aperture, and a holding plate mounted in the enlarged aperture, said holding plate having a rope aperture aligned with the radial aperture, said

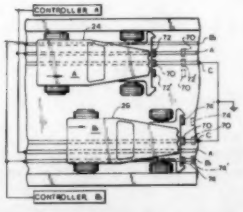
braided rope positioned in the radial aperture and passing through the rope aperture of the holding plate, said rope having a portion knotted and fused together in the enlarged aperture to lock the rope to the ball, said rope having a length more than two times greater than the length of the rod.

4,415,156
MATCHED SET OF GOLF CLUBS
Theodore P. Jorgensen, 3455 L St., Lincoln, Nebr. 68510
Filed Aug. 26, 1981, Ser. No. 296,572
Int. Cl.³ A63B *53/00*
U.S. Cl. 273—77 A **14 Claims**



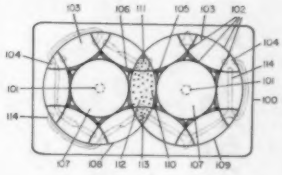
1. A correlated set of more than two golf clubs in which the golf clubs have different lengths and each has a shaft representing an x axis with a grip having a preselected wristcock axis at one end and a club head having a center of mass at the other end, one of said clubs being selected as a master club having the desired characteristics for the golfer and all of the clubs but the master club having an added mass rigidly secured to the golf club at a point one half the distance between the wristcock axis of the grip and the center of mass of the clubhead, each of the clubs having the same overall mass despite their difference in length, the mass of the club head and the mass of the added mass rigidly secured at the midpoint being so computed that the first moment of each club in the correlated set is within fifteen one-hundredths of a percent (0.15%) of the first moment of each adjacent club in the set and the second moment of each club in the correlated set is within fifteen one-hundredths of a percent (0.15%) of the second moment of each adjacent club in the set, with the first and second moments of each club being measured about said wristcock axis.

4,415,157
TWO-WAY SLOTLESS ROAD RACING GAME
Robert G. Lahr, New York, N.Y., assignor to Ideal Toy Corporation, Secaucus, N.J.
Filed Sep. 28, 1981, Ser. No. 306,043
Int. Cl.³ A63F *9/14;* **A63H** *18/12*
U.S. Cl. 273—86 B **10 Claims**



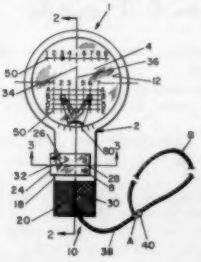
6. A toy vehicle game including a relatively flat slotless track having spaced sidewalls defining a pair of lanes therebetween; a pair of toy vehicles each having a body, reversible electric motor and means for steering said vehicle into one or the other of said lanes depending upon the polarity of current supplied to the vehicle's motor; means for supplying current of the same polarity to each reversible electric motor regardless of the direction of travel of said toy vehicles; means for selectively and independently reversing the polarity of current supplied to the motors of said toy vehicles regardless of the lane each vehicle is in and the direction in which the vehicle is traveling on the track.

4,415,158
PUZZLE
Douglas A. Engel, Englewood, Colo., assignor to General Symmetrics, Inc., Englewood, Colo.
Filed Sep. 21, 1981, Ser. No. 304,092
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **12 Claims**



1. A puzzle comprising a base for rotatably supporting segmented sections cooperating to form at least two geometric figures of circular cross section, said segmented sections being rotatable about non-orthogonal axes, the geometric figures overlapping to form an area of common intersection in a plane through the geometric figures, said segmented sections being defined along an outer edge by the locus of said circular cross sections and along an inner edge by an arc of radius equal to the radius of said circular cross section in said plane, each of said segmented sections dissected by at least two other arcs of radius equal to the radius of said circular cross section in said plane to form at least three separate pieces, each of said pieces being movable to a position anywhere in any of said geometric figures including the area of common intersection.

4,415,159
GOLF STANCE VIEWER
Paul Matheny, and Frances V. Matheny, both of 6491 Fox Run Cir., Jupiter, Fla. 33458
Filed Sep. 21, 1981, Ser. No. 304,026
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—187 A **16 Claims**



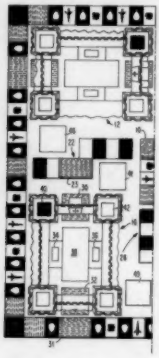
1. A golf stance viewer including a mounting body, said mounting body having lens means therein to allow a golfer to look through said lens means and view his feet, said mounting

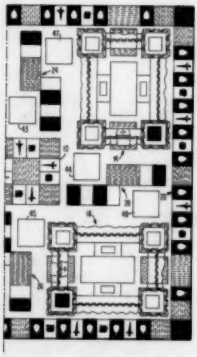
body having a reflective device to aim in a desired direction away from said golfer while said lens means is positioned to view the golfer's feet, an indicating means comprising at least one feet indicating line so that as the golfer looks through said lens means said feet indicating line is viewed with the golfer's feet, said feet indicating line indicating feet placement therewith so that desired feet placement can be repeated.

4,415,160
GAME APPARATUS

Herbert J. Lamb, 244 Maryland Ave., Staten Island, N.Y. 10305

Continuation of Ser. No. 86,716, Oct. 22, 1979, abandoned. This application Jul. 22, 1981, Ser. No. 285,711
Int. Cl.[3] H63F *3/00*
U.S. Cl. 273—243 **8 Claims**



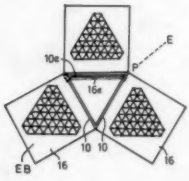


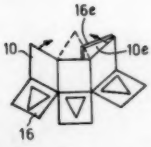
3. A game apparatus comprising in combination:
a first game piece;
a first inner game-playing area comprising a number of contiguous spaces upon which game pieces may be played;
a second outer game-playing area comprising a number of contiguous spaces upon which game pieces may be played;
said second outer game playing area being peripheral to said first inner game-playing area;
first means associated with a first number of said spaces identifying said first number of spaces as being first-deck spaces;
second means associated with a second number of spaces identifying said second number of spaces as being second-deck spaces;
at least one pathway comprising a number of contiguous spaces upon which game pieces may be played, said pathway located intermediate to said first and second game-playing area,
said pathway forming a route between said first and said second game-playing areas, said pathway being further provided with at least one game-playing area entry point adjacent each of said first and second playing areas;
said pathway and said first and second game playing areas being structured with respect to each other such that a game piece entering play can be moved from space to space along said pathway toward either said first game-playing area or said second game-playing area to thereby enter one or the other of said game-playing areas via one of said game-playing area entry points,
a defended zone adjacent said pathway, said defended zone having at least one defended zone entry point;
a first deck of playing cards, said first deck of cards having first indicia thereon for identifying them as first-deck cards and for correlating said first deck of cards with said first-deck spaces;
a second game piece;
a second deck of second playing cards, said second deck of cards having second indicia thereon for identifying them as second-deck cards and for correlating said second deck of cards with said second-deck spaces;
said first and second game pieces and said first and second spaces having distinguishing markings thereon for distinguishing said first game pieces and said second game pieces from each other and for correlating said first game pieces with said first number of spaces and for correlating said second game pieces with said second number of spaces.

4,415,161
GAME BOARD

David A. Westell, Box 69792, Station K, Vancouver, B.C., Canada

Filed Jun. 4, 1981, Ser. No. 270,572
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—285 **6 Claims**





3. Game board assembly comprising:
a central column designed to stand upwardly on a horizontal surface,
not less than three and not more than four playing board panels designed to rest on said playing surface,
said playing board panels being connected to said column to extend outwardly therefrom,
the directions of horizontal extension of said playing board

panels being approximately equally spaced about said column,

a playing board delineated on each of said playing board panels, said playing boards being substantially identical to each other,

wherein the dimensions of said column and the dimensions of said playing boards and the playing board location on each said playing board panel are such that each playing board is obscured by said column to a person seated at the horizontal surface and located in the opposite direction from said column to the playing board,

wherein said column is composed of substantially similar rectilinear panels hinged to each other on side edges as defined by the erected attitude of the column and said playing boards are each hinged to a respective bottom edge of one of said rectilinear panels.

4,415,162

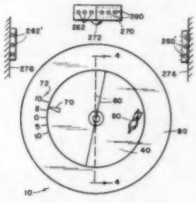
DART TARGET SYSTEM

David P. Sheppard, 7928 State St., Ralston, Nebr. 68127

Filed Jul. 27, 1981, Ser. No. 287,362

Int. Cl.³ F41J *3/00, 3/02*

U.S. Cl. 273—371 **6 Claims**



1. A target system comprising a a frame, first target module movably mounted on said frame for rotation about a first substantially horizontal axis, said first target module having a target module surface disposed transversely to said axis, said surface being suitable for penetration by pointed ends of darts sufficient to support and retain darts stuck therein whereby a dart stuck in said first target module on one side of a vertical plane extending through said axis tends to cause said first target module to rotate about said first axis downwardly on the side of said vertical plane in which said dart is stuck, a dart with a pointed end, said pointed end being stuck in said target module surface, a victory indication means correlated with said first target module and said frame, whereby at a given time the position of said first target module with respect to said frame can be sensed by the players, said victory indication means comprising an electrical signal system having a sensible signal.

said signal being activated responsive to the position of a magnetically attractable member with respect to a magnetically operated switch, the magnetically attractable member and the magnetically operated switch being permanently mounted during use of said system one on said target module and one on a portion of said system which is fixed to said frame.

4,415,163

PORTABLE VOLLEYBALL APPARATUS

Darrell A. Schoenig, 432 Clover La., Ft. Collins, Colo. 80521

Filed Feb. 22, 1982, Ser. No. 351,254

Int. Cl.³ A63B *61/04, 71/02*

U.S. Cl. 273—411 **2 Claims**

1. A portable volleyball apparatus comprising:

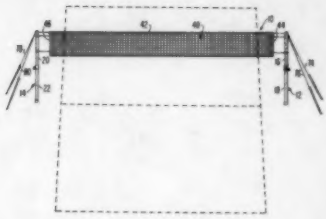
a pair of space-opposable poles each composed of a pair of mutually-telescopable tubes;

a pair of adjustable clamps individually disposed on respective ones of said poles in a position to enable locking of said tubes of each pair thereof at a desired degree of telescopic extension;

a rectangular, elongated net having space-opposed side margins and a top margin;

a rope secured to said top margin and securable between the tops of said poles;

a first pair of ties each secured individually at one end to an upper portion of a corresponding side margin and each secured individually at its other end to a corresponding upper end of a respective one of said poles, said ties being so secured as to induce resilient tension in said ties;



a second pair of ties each secured individually at one end to a lower portion of a corresponding side margin and each secured individually at its other end to a corresponding intermediate portion of a respective one of said poles, said second pair of ties also being so secured as to induce resilient tension therein;

and a plurality of lines each of selectively adjustable length, respective pairs of said lines diverging downwardly and outwardly from the top of corresponding ones of said poles into securement with a substrate upon which the lower ends of said poles are placed.

4,415,164

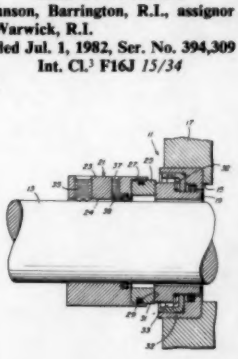
METHOD AND DEVICE FOR ALIGNING AND SECURING A MECHANICAL SEAL ELEMENT AND THE LIKE ON A SHAFT

Norman E. Johnson, Barrington, R.I., assignor to EG & G Sealol, Inc., Warwick, R.I.

Filed Jul. 1, 1982, Ser. No. 394,309

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—1 **9 Claims**



4. A method of fixing an annular member to a shaft and aligning their centerlines comprising the steps of positioning said annular member on said shaft with clearance therebetween, causing a first adjustable means at a first axial location on said annular member to engage said shaft, and causing a second adjustable means at a second axial location on said annular member and axially aligned with said first adjustable means to engage said shaft, said first and second adjustable means operable to take up clearance between said annular member and said shaft and to render their centerlines parallel

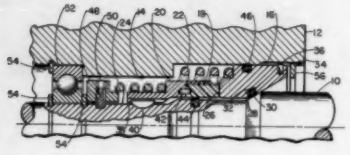
or concentric, and thereafter securing said annular member to said shaft.

4,415,165

INTEGRAL ELASTOMERIC/GRAPHITE DYNAMIC FACE SEAL

Leonard J. Martini, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1982, Ser. No. 446,294
Int. Cl.³ F16J *15/34, 15/40*
U.S. Cl. 277—27 **18 Claims**



1. A shaft seal combination wherein a rotating shaft mounted in an aperture through a wall with a pressure differential existing between its inner and outer surfaces is dynamically sealed against low and high pressure leakage, said shaft seal comprising:

a face-type rotary mechanical seal assembly fitted between the shaft surface and the aperture surface, said assembly having:

a first sleeve keyed nonrotatably to the aperture in a manner that the sleeve can slide back and forth along the shaft's axis; and

a second sleeve keyed to rotate with the shaft in a manner that said second sleeve can slide back and forth along the shaft's axis, wherein the first and second sleeves contain matching face-type seal surfaces which make sealable contact during the existence of high pressure differentials between the inner and outer surfaces of the wall;

an O-ring;

means for holding the O-ring, said means fitted not to rotate with the shaft but to slide back and forth axially in a manner that the O-ring is brought into sealable contact with the surface of the rotating shaft during periods of low pressure differential between the inner and outer surfaces of the wall; and

means for forcing the holding means and O-ring against the surface of the shaft during periods of low pressure differential between the inner and outer surfaces of the wall.

4,415,166

BEARING SEAL ASSEMBLY WITH DUAL ANNULAR SUPPORT RINGS

Thomas S. Beia, Cadillac, Mich., assignor to Cadillac Rubber & Plastics, Inc., Cadillac, Mich.

Filed Jan. 31, 1983, Ser. No. 462,545
Int. Cl.³ F16J *15/18*
U.S. Cl. 277—51 **19 Claims**

1. A bearing seal assembly comprising:

first and second annular rings of substantially identical construction, each having:

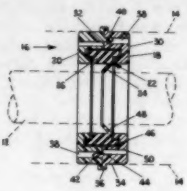
an outer face;

an inner face;

an outer circumferential surface; an inner circumferential surface; a cavity formed in the inner face of the inner circumferential surface; and

means formed in the inner face to snap-fit together two of said substantially identical annular rings with said inner faces thereof in juxtaposed facing relationship;

an annular gasket member having an annular portion and an inwardly-extending flange of relatively flexible nature to seal against a shaft, the annular portion of said gasket member being shaped to fit snugly within the cavities formed in the first and second rings which are joined together at inner faces thereof; and



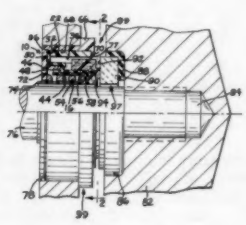
said first and second annular rings being joined together at the inner faces thereof with said annular gasket member therebetween.

4,415,167

ASSEMBLED MULTI-COMPONENT SEAL

Norbert W. Gits, 6417 Blackhawk Trail, Indian Head Park, Ill.

Filed Dec. 13, 1982, Ser. No. 449,188
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—88 **16 Claims**

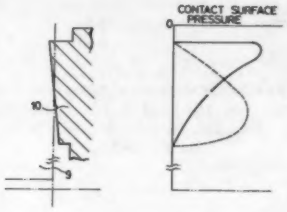


1. A rotary end face seal unit comprising, in combination, a seal housing having a first, outer surface portion adapted for reception into a machine member and an inner diameter adapted to receive a seal ring drive unit, said housing further including, at one end thereof, a radially inwardly extending end wall with an interior wall surface, and adjacent the other end thereof, a stiff but resilient, radially inwardly directed locking rib, a drive member having axially inner and outer end faces and a contoured inner surface adapted to mate with the outer surface of an associated primary seal ring in driving engagement, and to permit said seal ring to slide axially thereof, a primary seal ring disposed within at least a portion of said drive member and having driving surfaces corresponding to and directed oppositely to counterpart drive surfaces on said drive member, an exterior end face seal band forming a pair of said primary rings, said primary ring futher including an annular seat for locating a spring shroud, an elastomeric secondary sealing sleeve having axially inner, intermediate, and outer portions, an axially acting coil spring, and a shroud enclosing said spring on its inner diameter, on one end thereof and at least a portion of its outer diameter, said sleeve being held into fluid-tight sealing relation at its axially inner end between said housing end wall and said inner end wall of said drive member, and at its axially outer end between a portion of said spring shroud and said annular seat on said seal ring, said sleeve further having an intermediate portion lying adjacent a portion of said spring shroud and being adapted for a rolling or buckling action to permit free but limited axial movement of said primary seal ring relative to said housing and drive member.

4,415,168
MECHANICAL SEAL

Akira Takenaka, and Tatsuhiko Fukuoka, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Continuation of Ser. No. 133,713, Mar. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 895,072, Apr. 10, 1978, abandoned. This application Apr. 8, 1982, Ser. No. 366,809
Claims priority, application Japan, Apr. 12, 1977, 52-41838; Mar. 3, 1978, 53-24137; Mar. 4, 1978, 53-24138
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—96.1 **8 Claims**



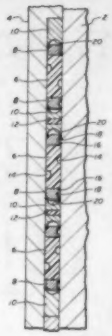
1. A mechanical seal which comprises:
(a) stationary means including a seating ring which receives therethrough a rotatable shaft and has an annular sliding contact surface, and
(b) a follower ring mounted to rotate with said rotatable shaft and has another annular sliding contact surface in sliding contact with the sliding contact surface of said seating ring when the shaft is rotated causing relative motion in one direction between said sliding contact surfaces,
(c) in said mechanical seal, a pressurized fluid which consists of a liquid or a mixture of a gas and a liquid being sealed in on the outside of said follower ring and the inside thereof is connected to the air,
(d) said mechanical seal being composed of a material that is subject to thermal deformation under high temperature conditions and is effective to avoid the leakage of said pressurized sealed fluid from the outside to the inside thereof,
(e) a raised portion is disposed along the periphery of said sliding contact surface of the follower ring,
(f) said raised portion being defined by swelling said periphery in the direction of the axis of said rotatable shaft as compared with the inside portion of said sliding contact surface, and
(g) the height of said outside raised portion on said sliding contact surface being effective to compensate for thermal deformation taking place during operation of the seal, the axial extent of said raised portion being in the range of about 1 to 3 microns, said raised portion being a circumferentially continuous annular surface, said contact surface having a diametral cross section which continues from the radially inner edge of said contact surface away from the shaft, smoothly and without interruption to and through said raised portion to the radially outer periphery of said contact surface.

4,415,169
SEAL FOR CONCENTRIC TUBULAR MEMBER

Yung J. Kim, Hacienda Heights, Calif., assignor to Baker International Corporation, Orange, Calif.

Filed Sep. 28, 1981, Ser. No. 306,458
Int. Cl.³ F16L *15/02, 55/00*
U.S. Cl. 277—125 **32 Claims**

1. A seal system for establishing sealing integrity between an inner tubular member and a concentric outer tubular member, comprising:
a cylindrical sealing element encircling said tubular member;
cylindrical back-up means, axially spaced from said sealing element, for preventing axial extrusion of said sealing element therepast; and
an intermediate member between said sealing element and said back-up means, at least one peripheral surface of said intermediate member being recessed from the cooperating surface of the adjacent tubular member to form a cavity

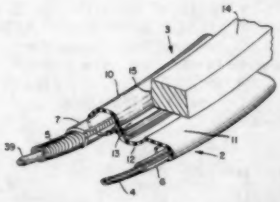


therebetween and a radially raised surface on said intermediate member between said cavity and said sealing element forming a constructed passage through which said sealing element axially extrudes into said cavity with sealing integrity being maintained with said adjacent tubular member immediate said radially rasied surface during contraction of said sealing element.

4,415,170
DOUBLE TORIC SEALING RING

Maurice Bonafous, Oloron, France, assignor to Applications Mecaniques et Robinetterie Industrielle A.M.R.I., France

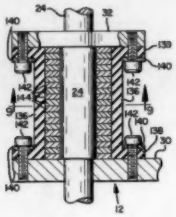
Filed Jan. 5, 1982, Ser. No. 337,279
Claims priority, application France, Jan. 13, 1981, 81 00460
Int. Cl.³ F16J *15/12, 15/32*
U.S. Cl. 277—163 **8 Claims**



1. A flexible double toric sealing ring comprising first and second sealing ring structures 2, 3, positioned about a common concentric axis, which ensure respectively a static seal and a dynamic seal, a counter ring which absorbs the compressive forces at the valve seat and also distributes contact pressure along the circumference, said counter ring movably mounted around the second sealing ring structure to allow self-centering of the sealing ring structure on the valve seat, and a sealing membrane, having an elastically deformable part, which interconnects the two sealing ring structures while partially covering them, said double toric sealing ring being characterized by said sealing membrane having one lateral side facing in a first direction along said common concentric axis and having an opposite lateral side facing in a second direction, opposite said first direction, along said common concentric axis, and by the

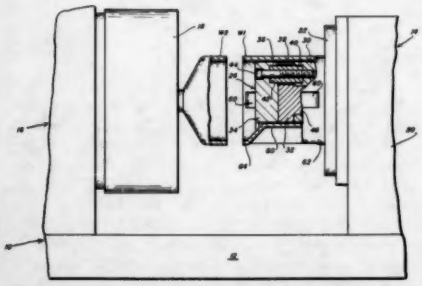
placement of the two sealing ring structures on opposite lateral sides of the middle section of the membrane.

4,415,171
CONTROL SYSTEM AND SHAFT SEAL FOR STIRLING CYCLE MACHINE
Linton A. Edwards, 13610 SE. Foster Rd., Portland, Oreg. 97236
Filed May 5, 1981, Ser. No. 260,822
Int. Cl.[3] F16J *15/02*; F02G *1/00*
U.S. Cl. 277—12 2 Claims



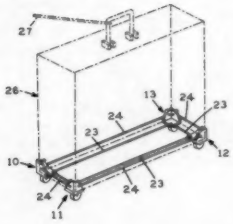
1. A seal for preventing passage of a fluid between the interior of an opening of a wall and the surface of a shaft extending through said opening, said shaft having an annular flange extending radially therefrom, the seal comprising:
(a) a flexible elastic tubular member having first and second ends and an interior diameter greater than the exterior diameter of said shaft;
(b) first and second attachment means for attaching said first and second ends respectively to said wall and to said annular flange; and
(c) a plurality of annular spacer members each having an outer diameter which is no greater than the interior diameter of said tubular member and an interior diameter which is no less than the exterior diameter of said shaft, the number of said spacer members being sufficient to substantially fill the interior of said sleeve between said first and second attachment means.

4,415,172
FRICTION WELDING MACHINE HAVING AN EXPANDING MANDREL BACKSTOP ASSEMBLY
Christopher T. S. Stevenson, New Britain, Conn., assignor to Litton Industrial Products, Inc., New Britain, Conn.
Filed Dec. 10, 1981, Ser. No. 329,247
Int. Cl.[3] B23B *31/12*
U.S. Cl. 279—33 2 Claims



1. A mandrel chuck for a backstop assembly of a friction welding machine for holding a first interiorly lobed workpiece, the friction welding machine including a movable workhead assembly for displacing a second rotating workpiece into forceful engagement with the first workpiece, the chuck comprising
a main body portion,
an end portion rigidly fixed to said main body portion,
an intermediate portion mounted between said main body portion and said end portion, all of said chuck portions having similar exterior lobes in a configuration which complements the interior lobes of said first workpiece, and
means for rotating said intermediate portion relative to said main body and end portions to interiorly grip the first workpiece wherein one end of the first workpiece projects from and is proximate to said chuck end portion, whereby said chuck will not contribute to any outward bowing or distortion of said workpiece end.

4,415,173
WHEELED CORNER MEMBERS FOR LUGGAGE
Jerry C. Tenebruso, 31-07 91st St., Jackson Heights, N.Y. 11369
Filed Jun. 24, 1981, Ser. No. 276,954
Int. Cl.[3] B62B *3/02*
U.S. Cl. 280—47.13 R 2 Claims



1. In combination, four, wheeled corner members for luggage each comprising a flat rectangular base, a caster roller attached to and depending from said base, two flat sides extending perpendicularly from said base in a direction opposite to said roller and being joined to said base along two contiguous sides thereof and being joined to each other along contacting sides thereof, each said corner member being adapted to closely fit around a base corner of a rectangularly based oblong-sided stiff piece of luggage, the base of each corner member being in contact with the base of said piece of luggage and the flat sides of each corner being in contact with the sides of said luggage adjacent to the base thereof, elongated elastic members connected to and interconnecting each said base of a corner member, elongated elastic members connected to the side of one corner member and connected to and interconnecting the side of another corner member along each respective side of said luggage, the corners of said luggage which are in contact with said corner members being separated by a greater distance than the relaxed length of each said elastic member between adjacent corner members within the normal elastic elongation of said members.

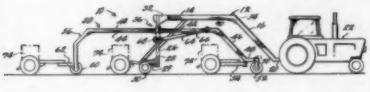
4,415,174
MULTIPLE IMPLEMENT TOWING APPARATUS
Gary Koehn, N. Sedan Rte. Box 259, Dalhart, Tex. 79022
Filed Dec. 21, 1981, Ser. No. 332,514
Int. Cl.[3] B60D *1/14*
U.S. Cl. 280—411 C 8 Claims

1. A towing apparatus for towing at least two implements in selected positions relative to the towing vehicle, comprising:
a first arm means having one end for attachment to a towing vehicle and another end spaced a selected distance from said one end, pivot means mounted adjacent said another end,
second arm means having an intermediate portion mounted on said pivot means for pivotal movement relative to said first arm means between a first, retracted position and a second,

extended position, means for moving said second arm means between said first and second positions,

said another end of said first arm means having implement towing means connected thereto and wheel means for supporting said another end of said first arm means for movement over the ground,

said second arm means having first and second opposite ends spaced apart selected distances from said intermediate portion, said first and second ends each having wheel means for supporting each said respective end for movement over the



ground with said second arm means in either said first, second or any intermediate position, said first and second ends each having implement towing means connected thereto,

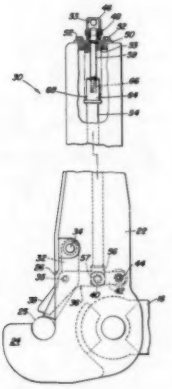
said first arm means comprising a first generally horizontally extending beam, a second beam having one end rigidly secured to an end of said first beam to extend generally downwardly therefrom, and a third beam rigidly secured at one end to the other end of said first beam to extend generally downwardly therefrom whereby said first beam is spaced a selected distance above the ground when said apparatus is in use.

4,415,175

COUPLER LATCH MECHANISM WITH A SELF-OPENING FEATURE

Carl E. Kainer, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 23, 1982, Ser. No. 391,260
Int. Cl.³ B60D *1/04*
U.S. Cl. 280—460 A **14 Claims**



1. A coupler latch mechanism having a self-opening hookup feature for facilitating connection of a hitch pin to a hook member, said hook member including a frame with a hook formed on a lower portion thereof, said coupler latch mechanism comprising:

(a) a latch bar pivotally connected to said frame above said hook and movable between an open position permitting engagement of said hitch pin into said hook and a closed position preventing disengagement of said hitch pin from said hook;

(b) a trigger pivotally connected to said latch bar and having a finger extending downwardly towards said hook and rearwardly beyond said latch bar, said trigger being movable between an open position permitting engagement of said hitch pin into said hook and a closed position preventing release of said hitch pin from said hook;

(c) a lever pivotally connected to an upper portion of said frame and movable between an open and a closed position;

(d) a motion transmitting link extending between and having opposite ends pivotally connected to said lever and to said trigger such that manual movement of said lever from its open to its closed position will effect movement of said trigger and said latch bar from their respective open to their respective closed positions, such that movement of said trigger from its closed to its open position by engagement with said hitch pin will effect movement of said latch bar and said lever to their respective open positions; and

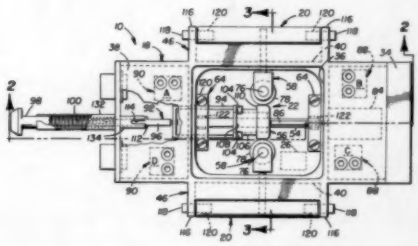
(e) biasing means urging said rod to a downward position for yieldably resisting movement of said trigger and said latch bar to their respective open positions when said lever is in its closed position whereby contact of said hitch pin against said finger causes said trigger to pivot on said latch bar and force said rod upward thereby opening said lever and effecting self-opening of said latch bar so that said hitch pin can engage said hook.

4,415,176

ELECTRONICALLY RELEASED SNOW SKI BINDING

Maury L. Hull, Winters, and Lee Dorius, Davis, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 5, 1981, Ser. No. 270,925
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—612 **8 Claims**



1. A ski binding for releasably securing a ski boot having a boot plate to a ski, said ski binding comprising:

a housing defining a generally elongated platform having an upper side, a lower side, a forward portion, a middle portion and a rearward portion, said middle portion having a pair of lateral edges;

a pair of clamps, each of said clamps including an upper end portion and a lower end portion, said housing further including first mounting means for rotationally mounting each of said clamps in a facing relationship to a different one of each of said lateral edges, each of said clamps being rotatable between a first position and a second position, said upper end portion being adapted for securing said boot plate to said upper side when each of said clamps is in said first position;

bias means for maintaining each of said clamps in said first position, said upper end portion of each of said clamps being adapted for securing said boot plate to said upper side when each of said clamps are in said first position;

a first pair of strain rings mounted to said forward portion of said platform and a second pair of strain rings mounted to said rearward portion of said platform, means for mounting said first pair and said second pair of strain rings to the surface of said ski, wherein said housing is mounted on said ski in a spaced apart relationship, each of said strain

rings having a plurality of strain gages thereon, said strain gages measuring flexure of said strain rings in response to dynamic forces causing relative movement between said platform and said ski and being interconnected to develop a plurality of electrical signals as a function of components of said forces, each of said electrical signals being associated with one of said components;

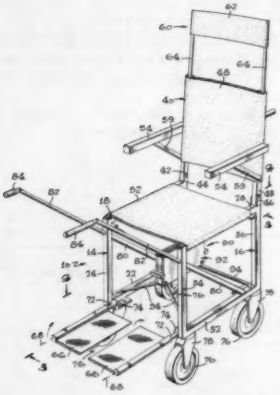
control means responsive to said signals for analyzing said signals and operative to develop a release signal upon one of said components exceeding a predetermined limit, said bias means being further responsive to said release signal and operative to rotate each of said clamps to said second position.

4,415,177

FOLDING WHEELCHAIR

Thomas K. Hale, Glendale, and Peter P. Kavaloski, Los Angeles, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 15, 1981, Ser. No. 330,837
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—650 **11 Claims**



1. A folding wheelchair having a seat, backrest, and a plurality of wheels, comprising:

(a) two frame members, said frame members each including upper segments defining therebetween the width of said seat when said wheelchair is in an unfolded position and lower segments for accepting said wheels;

(b) a spider mechanism adapted for holding said frame members in a spaced-apart wheelchair "unfolded" position and for providing means to collapse said frame members into a close proximity wheelchair "folded" position, said spider mechanism comprising:

first and second pairs of leg elements, each of said leg elements having upper and lower support legs including a central portion therebetween, first and second pairs of said upper support legs being rotatably secured to upper segments of first and second ones of said frame members, respectively, and corresponding first and second pairs of said lower support legs being rotatably secured to corresponding lower segments of said first and second frame members; and

an elongated body having at least two generally parallel guide slots, said central portions of said first pair of leg elements being slidably retained in a first one of said guide slots and said central portions of said second pair of leg elements being slidably retained in a second one of said guide slots, said elongated body being arranged relative to said frame members such that when said wheelchair is in the unfolded condition said central portions are maintained against respective opposite ends of said guide slots, and when said wheelchair is in the folded condition, said central portions are positioned in the longitudinal center area of said guide slots; and

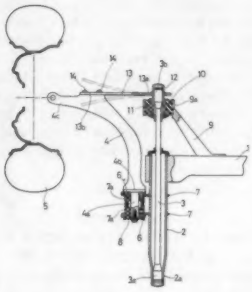
means for maintaining said leg element central portions against said guide slot ends.

4,415,178

SUSPENSION FOR MOTOR VEHICLES

Suehiro Hatsushi, Asaka; Tetsuro Mitsui, Niiza, and Takeomi Miyoshi, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,986
Claims priority, application Japan, Dec. 26, 1980, 55-186280; Jan. 6, 1981, 56-478[U]; Apr. 28, 1981, 56-64512[U]
Int. Cl.³ B60G *11/20*
U.S. Cl. 280—664 **7 Claims**



1. A suspension system for a motor vehicle having a body, said suspension system including at least a pair of lateral suspensions each comprising:

a shock absorber having an upper end thereof adapted to be mounted on said body of said motor vehicle;

a knuckle operatively connected to said shock absorber for supporting a wheel thereon;

a radius arm adapted to be mounted at one end thereof on said body and at a distal end thereof on said knuckle;

a rubber bushing which is resilient in substantially the fore-and-aft direction of said motor vehicle, said rubber bushing supporting said one end of said radius arm on said body;

a torsion bar spring having one end thereof adapted to be fixed to said body, and having a substantially twistable and flexible distal end, and being adapted to extend in substantially the fore-and-aft direction of said motor vehicle;

a resilient lower arm having one end thereof fixed to said distal end of said torsion bar spring and the other end thereof fastened to said distal end of said radius arm, said lower arm being resiliently flexible in substantially the fore-and-aft direction of said motor vehicle and rigid in substantially the vertical direction thereof; and

said lower arm comprising a leaf spring.

4,415,179

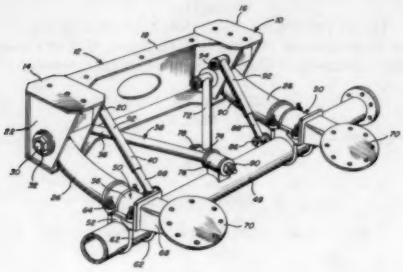
AXLE AND AIR BAG SUSPENSION

Joseph A. Marinelli, P.O. Box 859, Frew Mill Rd., New Castle, Pa. 16103

Filed Apr. 15, 1981, Ser. No. 254,399
Int. Cl.³ B60G *11/62*
U.S. Cl. 280—713 **13 Claims**

1. In a trailing arm suspension including a forward chassis mount portion, a front-to-rear extending trailing arm having its forward end pivotally suported from said mount portion for oscillation about a horizontal axis extending transversely of said arm, an elongated axle end disposed generally parallel to

said axis, resilient material bushed sleeve means stationarily mounted on said axle in position generally normal thereto and mounted longitudinally on the rear end of said arm for limited angular displacement thereabout against longitudinal displacement relative to the arm, said sleeve means including an air bag lower mount portion stationarily mounted thereon, said resilient material bushed sleeve means including a lower upwardly



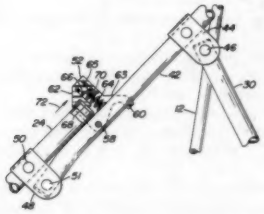
opening generally semi-cylindrical sleeve section stationarily supported on said axle end, an upper downwardly opening generally semi-cylindrical sleeve section disposed over and opposing said lower sleeve section, resilient sleeve structure disposed about said rear end of said arm, and means operatively clampingly engaged with said sleeve sections with the latter clamped about said resilient sleeve structure and the rear end of said arm.

4,415,180

STROLLER LATCH

Rex E. Payne, Jr., Elverson, Pa., assignor to Dawn Designs, Inc., Elverson, Pa.

Filed Apr. 27, 1981, Ser. No. 258,198
Int. Cl.³ B62B 7/08
U.S. Cl. 280—650 **9 Claims**



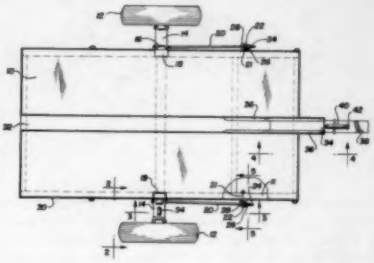
1. A latch comprising a latch member extending between first and second frame members whose end portions overlap one another and which are generally parallel, the first frame member having one end pivotably connected to the second frame member at a location spaced from and adjacent one end of the second frame member, the latch member being pivotably supported on the first frame member and spring biased to a position wherein it embraces said ene of the second frame member, a surface on said latch member where finger pressure may be applied to release the latch member so that said first and second frame members may pivot relative to one another, said surface being a cam surface so that said one end of said second frame member may contact said cam surface to pivot the latch member and then be snapped to a latched position without finger manipulation of the latch member, said latch member being generally U-shaped so as to have legs generally parallel to one another, a loop connected by extensions to said legs so as to define a hole through which the first frame member extends.

4,415,181

LOW GROUND CLEARANCE TRAILER

Charles F. McCall, 1703 Dorchester, and William P. Seelye, 220 Nicki La., both of Arlington, Tex. 76014

Filed Nov. 9, 1981, Ser. No. 319,258
Int. Cl.³ B60G 11/18
U.S. Cl. 280—700 **9 Claims**



1. In a trailer suitable for towing behind a vehicle such as an automobile or light truck, a suspension height adjusting mechanism comprising:

(a) a horizontal trailer frame having a generally flat floor surface and having first and second opposite sides;

(b) at each of said first and second opposite sides of said trailer frame, an upright pylon affixed to said trailer frame extending above the plane of said flat floor surface and having thereon first and second pivot bearings in spaced vertical relationship;

(c) at each pylon, a wheel hub having first and second pivot bearings in spaced vertical relationship;

(d) between each pylon and each wheel hub, a first floating link connecting the first pivot bearing of said upright pylon to the first pivot bearing of said wheel hub;

(e) between each pylon and each wheel hub, a second floating link in spaced parallel relationship with said first floating link and connecting the second pivot bearing of said pylon to the second pivot bearing of said wheel hub;

(f) on each said opposite side of said trailer and in spaced parallel relationship therewith, a torsion bar having first and second ends;

(g) means for adjustably fixing said first end of said torsion bar to said trailer frame so that axial rotation is prevented or allowed according to such adjustment wherein, with respect to each of said opposite sides of said trailer frame, the means for adjustably fixing said first end of said torsion bar to said trailer frame comprises:

(i) a drilled collar block extending from said side of said trailer frame for receiving said first end of said torsion bar;

(ii) screw threads at said first end of said torsion bar;

(iii) a raised annular shoulder on said torsion bar;

(iv) a nut and washer combination for turning onto said screw threads when said screw threads are inserted through said drilled collar block so that said drilled collar block is tightly held between the said annular shoulder and the said nut and washer combination; and

(v) adjacent knurled surfaces on said annular shoulder and said drilled collar block for binding said torsion bar against axial rotation when said nut and washer combination is turned tightly against said collar block; and

(h) means for fixing said second end of said torsion bar to said second floating link so that the pivot axis at said second pivot bearing of said pylon is coaxial relative to the torsion axis of said torsion bar.

4,415,182

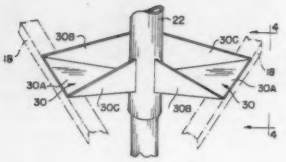
MOUNT FOR TRAILER JACK

Margie M. Smith-Williams, and Robert E. Williams, both of 7929 Stewart & Gray #10, Downey, Calif. 90241

Continuation-in-part of Ser. No. 228,184, Jan. 26, 1981, abandoned. This application Sep. 2, 1982, Ser. No. 414,652

Int. Cl.[3] **B60S** *9/02, 9/14, 9/22*

U.S. Cl. 280—763.1 **9 Claims**



1. In a trailer which includes a forwardly extending tongue for coupling the trailer to a towing vehicle, and which includes a vertically adjustable jack having an elongated tubular housing extending through the tongue; a mounting for the jack comprising bracket means having first and second bracket sections mounted on the tongue and engaging the tubular jack housing in essentially diametrically opposite relationship with respect to the jack housing; each of the bracket sections having a truncated triangular-shaped plate forming a bottom therefor with an arcuate forward edge for receiving the jack housing, and each bracket section having a pair of integral turned-up side walls on opposite side edges of said plate extending upwardly from the plane of the tongue at right angles to said plate, with the forward edge of each of the side walls engaging and extending along the jack housing.

4,415,183

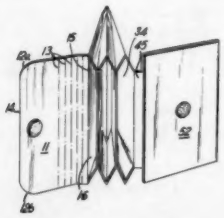
MULTI-POCKET PAD RETAINING FOLDER AND BLANK THEREFOR

Albert A. Benham, Granville, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 15, 1981, Ser. No. 311,798

Int. Cl.[3] **B42D** *3/12;* **B65D** *27/08;* **A45C** *11/34*

U.S. Cl. 281—31 **9 Claims**



1. A one-piece paperboard blank to be erected and glued to form a multi-pocket folder having means to retain a notebook, said blank comprising:

a series of substantially rectangular panels lying in tandem along an imaginary central axis and consisting of, aligned in order, a cover panel, a first body panel, a second body panel, a first pad retention panel and a second pad retention panel connected by a fold line to said first pad retention panel and having means to retain said notebook;

a plurality of flap members which, when adhered, form the multi-pockets, a pair of said flap members being connected by fold lines parallel to said central axis at opposite ends of each of said body panels, each pair of flap members comprising a short flap member having a second fold line parallel to its connecting fold line and a long flap member having four fold lines parallel to its said connecting fold line;

glue means to adhere portions of the inside faces of said two pad retention panels to each other; and

glue means to adhere portions of said flap members to form a plurality of pockets.

4,415,184

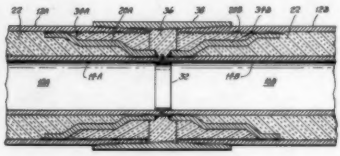
HIGH TEMPERATURE INSULATED CASING

Edgar O. Stephenson, and Victor R. R. Brown, both of Tacoma, Wash., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,547

Int. Cl.[3] **F16L** *59/14*

U.S. Cl. 285—47 **8 Claims**



1. In an insulated casing assembly for conveying a heated fluid,

said casing having spaced, concentrically positioned inner and outer tubulars with insulation sealed therebetween, an improved joining arrangement comprising:

a rigid thrust ring joining the inner and outer tubulars at each end of said casing;

said thrust ring joined to said inner tubular near its end and to the outer tubular at a location spaced a substantial distance from its end whereby a long path for heat transfer by conduction from the inner to the outer tubular exists;

the annular space between the outer surface of said thrust ring and the inner surface of said outer tubular constituting a coupling cavity;

coupling cavity insulation contained in said coupling cavity;

said outer tubular having threads at each end;

a threaded coupling ring for joining threaded ends of adjacent outer tubulars;

a seal ring sized to fit within said inner tubular and having a centrally positioned radially outwardly extending rib sized to fit between the ends of adjacent inner tubulars; and

a gap insulation ring contoured to fit in the gap between the coupling cavity insulation of similar adjacent casings.

4,415,185

FLEXIBLE METAL COUPLING FOR JOINING UNDERWATER PIPES LAID AT GREAT DEPTH

Costantino Vinciguerra, Florence, and Giampaolo Bonfiglioli, Inzago, both of Italy, assignors to Nuovo Pignone S.p.A., Florence and Snam S.p.A., Milan, both of, Italy

Filed May 13, 1981, Ser. No. 263,158

Claims priority, application Italy, May 26, 1980, 22313 A/80

Int. Cl.[3] **F16L** *13/04*

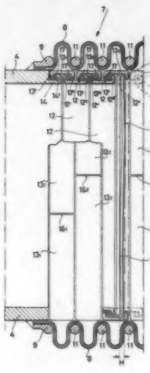
U.S. Cl. 285—114 **3 Claims**

1. A flexible coupling for joining two pipes which can be laid under water at great depths out of alignment and at different inclines, comprising:

metal bellows intermediate the free facing ends of the pipes, means secured to said pipes for fixing each end of said metal bellows to an end of a pipe in a sealed manner,

closed steel rings disposed about said bellows in its grooves for strengthening the coupling,

an inner reinforcing structure having an aligned series of steel rings of U-shaped cross-section kept side by side and coupled to each other in succession in an axial direction by an overlying series of steel rings of inverted U-shaped cross-section, wherein the lips of said inverted U-shaped steel rings are inserted into the grooves of two adjacent



rings of the underlying series of said U-shaped steel rings, and

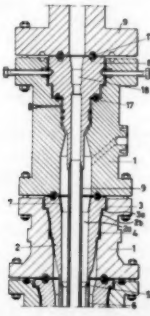
an axial undulated circular spring inserted between each lip of said inverted steel rings and each facing lip of said underlying steel rings which resiliently and alternately press against said facing lips to allow a high degree of deformation of the coupling.

4,415,186

FLANGING SYSTEM FOR SUSPENDING CASTING AND TUBING COLUMNS FOR HIGH PRESSURE OIL OR GAS WELLS

Marino Maestrami, Piacenza, Italy, assignor to Saipem S.p.A., Milan, Italy

Filed Dec. 9, 1980, Ser. No. 214,797
Claims priority, application Italy, Feb. 19, 1980, 20003 A/80
Int. Cl.³ E21B *19/10*
U.S. Cl. 285—142 **4 Claims**



1. A system for suspending columns for high pressure oil or gas wells within superimposed spools having adjacent flanges thereon for joining the spools and hangers in bores in the spools having axial cylindrical bores therethrough comprising:

a lower spool with the surface of the bore therein including an inner annular horizontal projection at the upper end thereof and a depending frusto conical shape, and an upper spool contiguous therewith having an annular counter seat in the bottom thereof for receiving a sealing ring, and means extending through the adjacent flanges for joining said spools together,

a hanger within said lower spool having a lower end which is threaded for connecting a column thereto, an upper end which is threaded for connecting a hanging tube thereto, and an outer surface between said ends which has a frusto conical shape that is complimentary to and is received by said frusto conical portion of said bore in said spool with an outer horizontal annular projection at said upper end which rests upon said corresponding inner annular projection of said lower spool,

an outer seal including an annular gasket made from a metal selected from the group consisting of copper and steel which rests between said projections, an annular groove in the outer frusto conical surface of said hanger, and an annular sealing gasket in said groove wherein the weight of the column squeezes said gasket to facilitate sealing, and

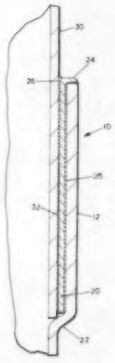
an inner seal including an annular upper seat in the top of said lower spool which opposes said counter seat in said spool thereabove and a steel ring joint in said seat and counter seat which is squeezed to provide sealing as said spools are joined together.

4,415,187

COMPOSITE METAL NIPPLE

Sharon J. Hudson, Jr., Toledo, Ohio, assignor to Sharon Manufacturing Company, Lambertville, Mich.

Filed Feb. 9, 1981, Ser. No. 232,646
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—173 **2 Claims**

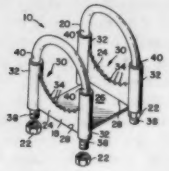


1. A composite metal nipple comprising: a tubular steel outer casing having a larger diameter end section connected to a smaller diameter section, an annular shoulder intermediate said sections, tubular copper sleeve extending from beyond the outer end of said larger diameter casing section to said shoulder and defining a circumferentially continuous, surface thereat, said sleeve being concentrically disposed on the inside of said larger diameter casing section and having an outside diameter less than the inside diameter of the surrounding portion of said casing to provide an annular space therebetween, all of said portion of said sleeve extending beyond said casing being flared outwardly and extending radially outward a sufficient distance to cover the edge of said casing completely and defining a continuation of said annular space between said flare and said edge and to further provide an annular solder well in cooperation with an adjacent portion of a copper tube when such a tube is inserted into said nipple, and an impervious layer of fused copper alloy brazing material completely filling said annular space integrally joining said sleeve to said casing.

4,415,188
AUTOMOBILE EXHAUST PIPE CLAMPING DEVICE

Tom Ginter, Jr., Box 193, Clearfield, Ky. 40313

Filed Nov. 20, 1981, Ser. No. 323,601
Int. Cl.³ F16L *25/00, 13/14*
U.S. Cl. 285—420 4 Claims



1. A clamping member using a pair of U-bolts for securing pipe portions of an automobile exhaust system to each other, said clamping member comprising

first and second generally vertically extending end flanges spaced from each other,

a generally horizontally extending section intermediate of and connecting to each of said first and second end flanges at an edge thereof,

each of said end flanges having a cut-out portion on an opposite edge from the edge connected to said intermediate section for reception of a pipe portion to be clamped therein,

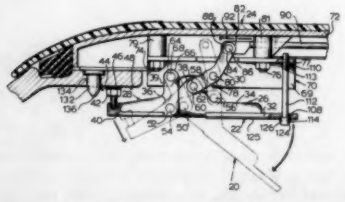
first and second sleeve portions connected to remaining opposite edges of each of said end flanges adapted to receive and support respective legs of each of the U-bolts,

said first and second end flanges, said intermediate section, and said sleeve portions being integral and formed from a single blank.

4,415,189
LOCK SYSTEM FOR REMOVABLE AUTOMOBILE ROOFS

Frank M. Kastelic, Jr., Warren, Mich., assignor to Falk, Kastelic, Heartwell, Inc., Warren, Mich.

Filed Mar. 5, 1981, Ser. No. 240,751
Int. Cl.³ E05C *3/08*
U.S. Cl. 292—196 4 Claims



1. For use with an automobile roof having a plurality of ears which cooperate with a latch mechanism to retain said roof in position on an automobile, said latch mechanism secured to the frame of said removable roof and having a lever arm which is pivotally attached near a first end and is free to move at a second end between a locked position and an unlocked position and having a relatively flat face at said second end being exposed to a user of said automobile and forming a part of a gripping area for moving said lever arm,

a locking system comprising:

a fastening device in the form of a threaded screw member having an axially elongated threaded body portion and a head portion at one end, said head portion being diametrically larger than said body portion and having a generally circular circumference and a generally hemispherical shape with only a single flat surface at the point of attachment to said body portion, said head portion having an axial opening extending thereinto opposite said body portion, said opening having at least one flat internal surface,

a tool having an end engageable with said flat internal surface in said head portion of said fastening device,

a first hole having a diameter larger than said body portion, but smaller than said head portion in said lever arm flat face and extending through said lever arm at said second end, said first hole having a diametrically enlarged area at said flat face a part of the depth of said first hole and having a diameter large enough to receive said head portion and of a depth sufficient to allow a portion of said head portion to be recessed below said flat surface,

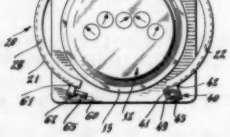
a second hole formed in said automobile roof frame aligned with said first hole when said lever arm is in the locked position, said second hole having a threaded internal wall complementary to said body portion

whereby when said lever arm is in said locked position, said screw member can be inserted through said first hole and threaded to engage said wall of said second hole, by using said tool, to retain said lever arm in said locked position.

4,415,190
LOCKABLE RING ASSEMBLY FOR ELECTRIC METER

Frederick P. Finck, Jr., and Timothy B. Ely, both of Fairfield, Conn., assignors to Highfield Mfg. Company, Div. of Clarkson Industries, Inc., Bridgeport, Conn.

Filed Apr. 6, 1981, Ser. No. 251,272
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—256.6 12 Claims



1. A lockable ring assembly for securing an electric meter in a meter box wherein the electric meter and meter box are of the type having radially outwardly extending flanges disposed adjacent each other when the electric meter is installed in the meter box, the lockable ring assembly comprising:

(A) a split ring having a U-shaped cross section for embracing the adjacent flanges of the electric meter and meter box, the split ring being formed in two substantially semicircular ring parts and the split ring having a first joint permitting the split ring to be opened for installation over the adjacent flanges of the electric meter and meter box, and a second joint, the ring parts being joined together for articulated opening and closing action by hinge means joining the ring parts across the second joint, the hinge means comprising a bendable metal plate spanning the second joint and welded to the respective ring parts on both sides of the second joint;

(B) a keeper stud mounted to the split ring on one side of the first joint therein; and

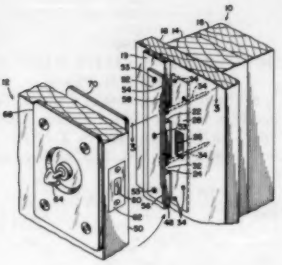
(C) a lock housing mounted to the split ring on the other side of the first joint therein, the lock housing defining a keeper stud opening for receiving the keeper stud and a lock receiving opening for removably receiving a barrel lock, wherein the keeper stud is received in the keeper stud opening when the split ring is closed, and when a barrel lock is inserted into the lock receiving opening, it retains the keeper stud in the lock housing, thereby preventing the split ring from being opened without removal of the barrel lock.

4,415,191

DOOR LOCKING MECHANISM

James B. Thorp, 5739 Rowland, Temple City, Calif. 91780

Filed Jul. 20, 1981, Ser. No. 284,644
Int. Cl.³ E05C *21/00*
U.S. Cl. 292—346 **8 Claims**



1. A reinforcing structure for a door and lock mechanism wherein the door abuts an elongated door stop on a door jamb in the closed position of the door, said structure comprising:

a door stop defining at least one recess;

a strike plate defining a bolt receiving aperture and having tab portions dimensioned and configured to extend into said at least one recess in the door stop, and having fastening means for mounting said strike plate on the door jamb; and

a jamb plate dimensioned and configured for mounting on the door stop with a first edge thereof in generally parallel relationship to a side of said strike plate and extending substantially to an edge of said door stop which abuts the door.

4,415,192

DOOR LOCKING KNOB FOR VEHICLE

Yutaka Kodama, Yokosuka, and Masakazu Miyoshi, Yokohama, both of Japan, assignors to Nissan Motor Co. Ltd. and Kato Hatsujo Kaisha, Ltd., both of Yokohama, Japan

Filed Mar. 23, 1981, Ser. No. 246,631
Int. Cl.³ E05C *13/02*
U.S. Cl. 292—347 **1 Claim**

1. A door locking knob arrangement including a head grip (2) with a vertically extending narrow part, said head grip being for a motor vehicle to prevent the vehicle door from opening when said head grip (2) is pushed down, said door locking arrangement being placed in a vehicle door trim and connected to a vehicle door lock, said door locking knob arrangement comprising in combination:

(a) an elongated knob body (1) integral with and extending from said head grip (2) including a leg portion (3) with an outer end, having an engaging hole (5) extending from said outer end through said leg portion (3) to the head grip (2), said engaging hole (5) being slit-shaped in cross-section, and, a pair of guide grooves (4), defined axially on both sides of said leg portion (3);

(b) a rod (10) with sides, said rod being disposed to be connected at one end portion of said rod to a door lock and having at least one engaging portion at the other end portion, said engaging portion extending along one side of said rod, and, at least one flat surface (9) extending axially along the other side substantially parallel to the engaging portion, said rod being so disposed as to enter said engaging hole (5); and,

(c) a fixing member (7) having a rectangular aperture therein, said fixing member having a pair of engaging pawls (6) loosely engaged with said leg portion (3) and guide keys (8) loosely engaged with guide grooves (4), said engaging pawls (6) also securing said knob body (1) to the upper portion of an automobile trim;

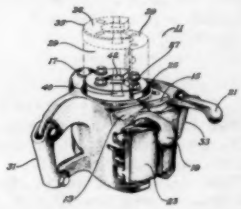
whereby, after said rod (10) is placed in the vehicle trim, said knob body (1) is inserted over said rod (10) through the aperture of said fixing member (7) along at least one flat surface (9) and then the head grip (2) together with the knob body (1) and the rod are turned 90° with respect to each other thus securing the head grip and knob body to the rod as the engaging portion of the rod engages the wall of said engaging hole.

4,415,193

SLIP SETTING RING

Charles E. Carlberg, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Feb. 27, 1981, Ser. No. 239,308
Int. Cl.³ A44B *21/00*
U.S. Cl. 294—102 A **7 Claims**



1. A slip setting ring for slip type derrick elevators of the type having a tapered bowl with a central bore adapted to receive pipe, said bowl having a plurality of pipe gripping slips slidably mounted in said bowl for movement between an upward pipe receiving position and a downward pipe gripping position, wherein the improvement comprises:

a setting ring selectively positioned with respect to said slips in said bowl so that downward movement of said ring causes movement of said slips from said pipe receiving to said pipe gripping position;

said setting ring having a pipe receiving opening concentrically aligned with said central bore of said elevator and having a pair of oppositely facing recesses, said recesses being transversely aligned with said pipe receiving opening;

a pair of matching inserts adapted to be slidably received within said oppositely facing recesses; and

biasing means for urging said inserts inwardly toward said pipe receiving opening for contacting said pipe.

4,415,194

VEHICLE HATCHBACK CLOSURE

Steven W. Bauer, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1981, Ser. No. 323,252
Int. Cl.³ B60R *5/04*
U.S. Cl. 296—76 **2 Claims**

1. In combination with a vehicle body having an opening:

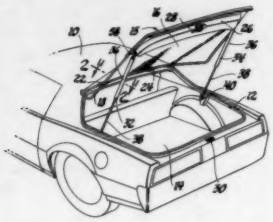
a glass panel;

hinge means mounting one end of the glass panel on the

vehicle body for movement between positions opening and closing the opening;

a tail member mounted on the glass panel at the end thereof opposite the hinged end and adapted to mount a latch element for latching the glass panel in the closed position;

a pair of telescoping struts having first ends mounted on the vehicle body and second ends connected to the tail member to bias the glass panel to the open position;



a decorative molding extending from the tail member to the end of the glass panel hingedly mounted on the vehicle body to cooperate with the telescoping struts in holding the tail member at the open position in the event of a breakage of the glass panel; and

rotation limiting means in the connection between the telescoping struts and the tail member whereby the tail member is limited in rotation about the telescoping struts in the event of breakage of the glass panel and bending of the decorative molding.

4,415,195

AUTOMOBILE WINDOWS

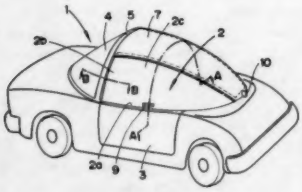
Akira Furukawa, Hamamatsu; Minoru Araki, Shizuoka, and Hideyuki Genma, Hamamatsu, all of Japan, assignors to Suzuki Motor Company Limited, Japan

Filed Apr. 13, 1981, Ser. No. 253,578

Claims priority, application Japan, Apr. 30, 1980, 55-57460

Int. Cl.³ B60J *7/04*

U.S. Cl. 296—146 **8 Claims**



1. An automobile window structure for an automobile having a roof, at least one door and a windshield, comprising:

a windshield frame connected to the windshield and having a slide guide;

a window on each side of the automobile at least one of which is slidable in said slide guide, each slidable window being curved outwardly and arcuately with respect to an interior of the automobile by a selected radius, said slide guide having the same selected radius for permitting each slidable window to slide by any selected amount into said guide from a fully closed to a fully open position, each slidable window being separate from a door of said automobile adjacent each slidable window respectively, and openable away from the respective door;

the roof of the automobile having a recess for receiving each of said slidable windows with at least a portion of each slidable window in said recess in a closed position of each slidable window, said recess for each slidable window having said selected radius;

each of said windows being slidable, said roof having two recesses, one for each window, said recesses being one above the other so that, with both of said windows in an open position, said windows substantially overlap each other.

4,415,196

GLASS WITH CONDUCTIVE STRIPS FOR SUPPLYING WINDSHIELD WIPER

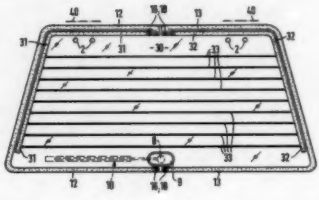
Hans Baum, and Egbert Balling, both of Cologne, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, France

Filed Jan. 30, 1981, Ser. No. 229,831

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004457

Int. Cl.³ B60J *1/20*

U.S. Cl. 296—201 **11 Claims**



1. A window for use with a vehicle comprised of safety glass and an electric motor carried by said window, means supporting said window on said vehicle for movement about a pivot axis, said pivot axis being located adjacent an edge of said window and said electric motor disposed adjacent another edge of said window, conducting means characterized by current feed lines for the electric motor, said current feed lines formed of conducting strips disposed within the region of the edges of said window and along the edges of said window, said conducting strips comprised of a conductive enamel composition including silver particles, and connector means carried by said conducting strips adapted for connecting said conducting strips both to a power source of said vehicle and said electric motor.

4,415,197

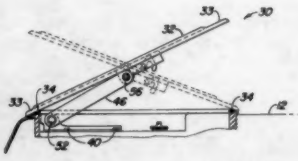
HINGED HATCH ROOF ASSEMBLY FOR A VEHICLE CAB

Raymond J. Meyer, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 31, 1981, Ser. No. 298,237

Int. Cl.³ B60J *7/08*

U.S. Cl. 296—216 **3 Claims**



1. A hinged hatch assembly comprising:

(a) a hatch completely covering an opening in a roof when in a closed position;

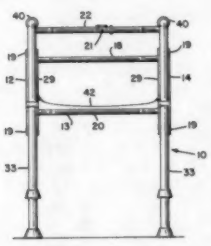
(b) a frame formed about the periphery of said opening having front and rear surfaces aligned approximately parallel to front and rear surfaces of said roof, said frame having a seal attached to a top surface thereof which cooperates with said hatch when said hatch is in said closed position;
(c) a first pair of brackets each attached to both a rear surface of said frame and to a side surface of said frame and which extend forward within the periphery of said frame;
(d) a second pair of brackets attached to a bottom surface of said hatch which extend downward therefrom;
(e) a pair of support arms each having a first and a second forked end, each of said support arms being pivotally attached at said first forked end to one of said first pair of brackets and being pivotally attached at said second forked end to one of said second pair of brackets for permitting said hatch to pivot relative to said pair of support arms in two directions such that in one direction one side of said hatch will contact the rear surface of said frame and in the other direction an opposite side of said hatch will contact the front surface of said frame;
(f) a rod supported by said second pair of brackets and fastened at opposite ends to said second forked end of each of said support arms to prevent said hatch from being opened askewly;
(g) frictional washers located between said first and second forked ends of said support arms and each of said adjacent pair of brackets for providing frictional contact therebetween;
(h) adjustable spring means for applying a predetermined force between said frictional washers and said corresponding bracket and forked ends of said support arms to retain said support arms and said hatch in a predetermined position relative to said roof; and
(i) locking means for locking said hatch to said roof, said locking means including a catch secured to a bottom side of said hatch which is engageable with a latch secured to said roof.

4,415,198

SEAT FOR INVALID WALKER

Gordon D. Brearley, P.O. Box 8335, Alta Vista Terminal, Ottawa, Ontario, Canada K1G 3H8

Filed Nov. 18, 1980, Ser. No. 208,071
Int. Cl.³ A61H *3/04*; A63C *3/04*
U.S. Cl. 297—6 **4 Claims**



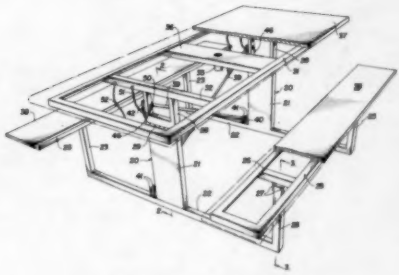
1. An invalid support apparatus readily convertible by a person using the apparatus between a first configuration in which it serves as a walker and a second configuration in which it serves as a seat, comprising:
a. two side frames, each including forward and rearward upright rigid frame members;
b. a front frame including horizontal rigid frame members extending between the forward upright frame members, said side frames and front frame cooperating as a walker to support an invalid;
wherein the improvement comprises:
c. a plurality of clamping means, one for each of the upright frame members, each clamping means comprising a strap wrappable about a frame member, and means for tightening or loosening the strap, said clamping means being adjustable along its associated upright frame member to any selected position within a substantial range;
d. a sheet of material of sufficient strength to support a person and readily foldable by a person using the apparatus;
e. means readily operable by a person using the apparatus to connect the sheet to and detach it from the clamping means, said sheet and frames cooperating when the sheet is so connected to define a seat, said sheet being readily portable when detached, said connecting and detaching means including:
1. a plurality of hooks, each fixed on and extending upwardly from one of said clamping means, each hook being open at its upper end; and
2. a plurality of hook engaging and disengaging means readily operable by a person using the apparatus and affixed to spaced points on the sheet, said sheet and frames cooperating to form a seat when the hook engaging means are engaged with their respective hooks.

4,415,199

FOLDING PICNIC TABLE

Clem B. Wright, South Fulton, Tenn., assignor to Waymatic, Inc., Fulton, Ky.

Filed Jan. 29, 1982, Ser. No. 343,747
Int. Cl.³ A47B *39/00*
U.S. Cl. 297—159 **8 Claims**



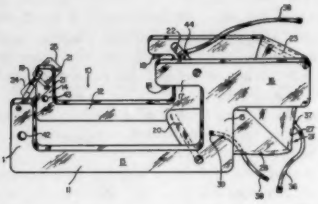
1. A folding picnic table comprising a pair of spaced parallel end frames each having a pedestal formed in two hinged sections adapted to fold inwardly toward each other and also adapted to assume extended positions with the hinged sections of the pedestals in end-to-end relationship, a table top frame pivotly attached to the upper hinged section of each folding pedestal, uprights on said end frames lying substantially in the planes occupied by the lower hinged sections of the pedestals, bench frames pivotly attached to the tops of the uprights and lying in planes which are parallel to the plane occupied by the table top frame, a single pair of cross braces having corresponding ends permanently, pivotly attached to said end frames and having opposite corresponding ends adapted for releasable attachment to the pedestals when their hinged sections are extended, and releasable locking pins for said opposite corresponding ends of the braces when they are engaged with the extended pedestals to lock the picnic table in an extended use position, said locking pins passing through locking openings in the braces and registering locking openings in the pedestals.

4,415,200

COMBINATION INFANT SEAT AND SWING

Carol Bourne, 1226 Villanova Dr., Davis, Calif. 95616

Filed Oct. 6, 1980, Ser. No. 194,763
Int. Cl.[3] A47D 1/10
U.S. Cl. 297—174 8 Claims



1. A device mountable on a conventional table as a seat for an infant, which device upon orientation generally 90° is employable as an infant swing for attachment to a swing support, said device comprising:

a pair of spaced planar supporting side sections, said sections being interconnected by a plurality of bracing members to form an integral unit;

a seat body disposed between said planar supporting side sections, said seat body comprising a back portion supported generally vertically at one end of said unit and a seat portion extending generally normal to and from the bottom of said back portion inwardly of said unit and generally horizontally;

said spaced planar supporting side sections each including a first elongated horizontal member extending forwardly from a point along the side of said seat portion, and generally coaxial therewith, said horizontal member terminating in

a pair of terminal generally vertical extending support members, said terminal support members also being generally parallel to said back portion, namely a forward and a rearward one, the rearward one of which is connected on its distal end to

a second generally horizontal member extending forwardly from the top of the side of said back portion, above, spaced from, and parallel to said first horizontal member, said horizontal second member being connected along the length thereof to said rearward terminal vertical extending support, said horizontal second member terminating at a point beyond said rearward support member and distant from the forward terminal vertical support member, and

wherein said bracing members which interconnect said planar side sections include a first bracing member interconnecting the forward terminal vertical members adjacent said upper ends thereof;

a second bracing member interconnecting said first horizontal members adjacent said seat portion;

a third bracing member interconnecting said second horizontal members at their fronts; and

a fourth bracing member interconnecting said second horizontal members adjacent the top of said back portion,

suspension means on or adjacent to the upper ends of each forward vertical terminal member for attaching a rope or chain thereto so said device can swing,

whereby said device can be mounted to a table or the like by inserting said forward support members under said table in abutting engagement with the underside thereof, and the second horizontal members abutting against the upper surface of said table thereby providing a seat for an infant,

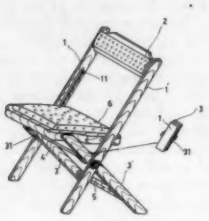
said device also being adapted to be removable from said table and converted into a swing by attaching elongated flexible members to said suspension means, and positioning the infant's buttocks on the back portion, and the infant's back against the seat portion of said device.

4,415,201

FOLDING CHAIR HAVING A REVERSIBLE SEAT

Teng-Ching Wang, Room 600, Chung An Bldg., 16, Ming Sheng W. Rd.3, Taipei, Taiwan

Filed Apr. 28, 1981, Ser. No. 258,294
Int. Cl.[3] A47C 27/00, 4/00
U.S. Cl. 297—57 30 Claims



1. A folding chair having a seat which is reversible to expose either a first sitting area or a second sitting area, said chair comprising:

a pair of separated long and short legs, each of said pairs having an upper end portion and a lower surface engaging end portion;

a seat back member connected between and separating said pair of long legs in the vicinity of said upper end portion of said pair of long legs;

pivot means connecting said pair of long legs and said pair of short legs one to another for permitting relative pivotal movement thereof;

a chair seat having front and rear ends and defining a surface upon which a person can sit when said chair seat is disposed substantially horizontally, said chair seat including a first sitting area on the upper surface and a second sitting area on the lower surface thereof;

connecting means pivotably connecting said front end of said chair seat to said upper end portion of said pair of short legs and slideably pivotably connecting said rear end of said chair seat to said pair of long legs for permitting said chair seat to be moveable between (a) a first unfolded position wherein said chair seat is disposed substantially horizontally exposing said first sitting area as the area upon which a person sits and each of said surface engaging end portions of each of said pairs of short and long legs are spaced apart relative to one another to support the weight of a person sitting upon said first sitting area; (b) a folded position wherein said pairs of short and long legs and said chair seat are substantially aligned one with another; and (c) a second unfolded position wherein said chair seat is disposed substantially horizontally exposing said second sitting area as the area upon which a person sits and each of said surface engaging end portions of each of said pairs of short and long legs are spaced apart relative to one another to support the weight of a person sitting upon said second sitting area; wherein

said connection means is for permitting reversal of said first and second areas by allowing movement between said first and second unfolded positions by virtue of the sliding connection of said rear end of said chair seat and said pair of long legs thus permitting said rear end to be simultaneously upwardly slideable and pivotable relative to said pair of long legs while said pivotable connection between said front end of said chair seat and said pair of short legs permit said chair seat and said pair of short legs to be moved into alignment with said pair of long legs in response to said upward sliding movement and, thereafter, downward sliding movement of

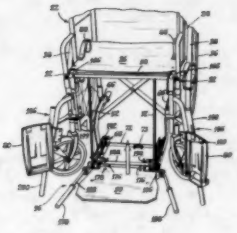
said rear end of said chair seat responsively effects movement of the front end of said chair seat to expose one or the other of said first and second sitting areas to permit a person to sit thereon as desired.

4,415,202

WHEELCHAIR ELEVATING APPARATUS ENABLING A USER TO LIFT HIMSELF FROM THE FLOOR TO A WHEELCHAIR SEAT

Melvin E. Pew, 211 Albert St., Washington, Ill. 61571

Filed Oct. 26, 1981, Ser. No. 314,753
Int. Cl.³ A61G 7/08
U.S. Cl. 297—217 **11 Claims**



1. In a wheelchair having a main frame with wheels on opposite sides and a seat, user-elevating apparatus storable in the space between the wheels and below the wheelchair seat comprising:

a forwardly extending elevating frame pivoted at the rear of the main frame for up and down tilting movement about a transverse horizontal axis relative to the main frame;

a rearwardly extending leveling frame pivoted at the forward end of the elevating frame for up and down tilting movement about a transverse horizontal axis relative to the elevating frame;

a substantially horizontal user-lifting seat supported at the front of the leveling frame;

manually movable lifting lever means located on one of said frames readily accessible to a user on the lifting seat;

means responsive to movement of the lifting lever means to lift the elevating frame; and

means responsive to movement of the elevating frame to tilt the leveling frame relative to the elevating frame and thereby maintain the lifting seat in a substantially horizontal position throughout a range of movement between floor level and the wheelchair seat level.

4,415,203

DENTAL CHAIR

Reginald E. Cawley, 24815 Bent Tree La., Lake Forest, Calif. 92630

Filed Aug. 15, 1980, Ser. No. 178,612
Int. Cl.³ A47C 7/36
U.S. Cl. 297—391 **4 Claims**

1. A dental chair comprising

a seat,

a back,

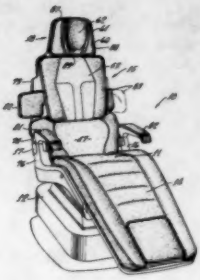
and a headrest having an outer part remote from said seat and an inner part adjacent said seat, said headrest including

a head support member having recess means for receiving the back of a human head,

a base member beneath said head support member for supporting said head support member,

pivot means for pivotally connecting the outer part of said head support member to said base member,

and means for tilting said base member from side to side for thereby tilting said head support member from side to side,



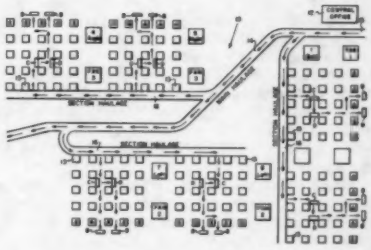
said head support member being pivotal about said pivot means upon such tilting for thereby imparting rotational movement to a head supported thereby.

4,415,204

EMERGENCY SYSTEM FOR MINES

Thomas Cavrak, R.D. #1, Box 77, Grindstone, Pa. 15442

Filed May 13, 1982, Ser. No. 377,983
Int. Cl.³ E21C 41/00
U.S. Cl. 299—1 **4 Claims**



1. In an underground mine having a plurality of locations capable of being mined and including fans associated with locations for providing fresh air thereto, mining equipment operable at at least certain of said locations, a load center in each location for providing power to the mining equipment and a central dispatcher or operator station, the improvement comprising a safety communication system including:

A. a cable extending from the central station to each of the locations;

B. an emergency receiver tied into the cable in each location and connected to the load center, the receiver including an alarm, an emergency switch and an oral communication system; and

C. a switchboard located at the central station and tied into the cable in independent signal communication with each location, the switchboard including a power on-off switch for each location and an oral communication system tied into the system of each location

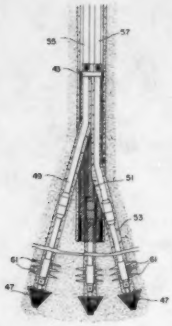
whereby an operator in the central station on the switchboard can selectively turn off and on power from the load center to the mining equipment in any given location while activating an alarm in that section, a mine personnel located in any given location can trip the emergency switch of the emergency receiver to activate the alarm and turn off power from the load center to the mining equipment in that given location and oral communication exists between the operator and each location.

4,415,205

TRIPLE BRANCH COMPLETION WITH SEPARATE DRILLING AND COMPLETION TEMPLATES

William A. Rehm, 12558 Westerly La.; Donald W. Dareing, 13914 Jaycreek Crt., both of Houston, Tex. 77070, and Edward T. Wood, 3415 Fawn Creek, Kingwood, Tex. 77339

Filed Jul. 10, 1981, Ser. No. 282,210
Int. Cl.³ E21B *43/28, 29/06*
U.S. Cl. 299—5 **6 Claims**



1. A method for forming multiple branch wells in the earth from a common main well hole comprising the steps of:

a. forming a main generally vertical hole in the earth;

b. inserting a casing into said main hole with the casing having at least two easily-penetrated section areas constituting windows at different vertical heights, said casing also having an internal indexing dog;

c. cementing said main casing in said main hole;

d. sequentially drilling each of the branch wells with at least two of said wells being drilled through said at least two windows through the lower window first as a drilling template engages the indexing dog to orient the drilling assembly;

e. inserting a multiple tube guide template with one branch casing for each of the branch holes into the main hole, said template engaging the indexing dog to orient the branch casings towards their respective branch holes; and

f. inserting all of the branch casing into their respective branch holes at about the same time and cementing the same.

4,415,206

DRILL SECTION AND METHOD OF HYDRAULICALLY MINING MINERAL FORMATIONS

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Filed Feb. 9, 1981, Ser. No. 232,439
Int. Cl.³ E21B *21/12*
U.S. Cl. 299—17 **9 Claims**

1. An improved drill string for use in hydraulic mining applications comprising:

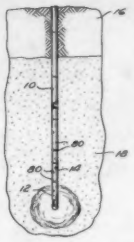
at least two drill sections interconnected in end-to-end orientation, each of said drill sections comprising:

a cylindrical casing having an outside diameter sized to be received within a bore hole and an inside diameter defining an interior region;

plural conduits extending axially within and mounted at non-concentric predetermined positions within said interior region;

complimentary shaped threaded portions formed on opposite ends of said cylindrical casing adapted to permit said at least two drill sections to be threaded together; and

stop means formed on said threaded portions for limiting the relative rotational travel of said at least two drill sections along said threaded portions, said stop means located to axially align each of said plural conduits of said at least two drill sections at said non-concentric predetermined



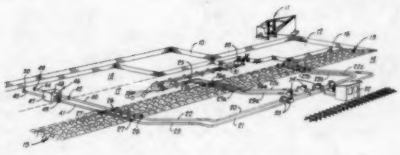
positions when said at least two drill sections are threaded together.

4,415,207

UNDERSPOIL SLURRY HAULAGE

Richard E. Doerr, Morgantown, W. Va., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 103,319, Dec. 14, 1979, Pat. No. 4,286,822. This application Aug. 4, 1981, Ser. No. 289,882
Int. Cl.³ E21C *41/04*
U.S. Cl. 299—18 **5 Claims**



1. A method for underspoil haulage of mineral product from a contour surface mine where a mineral layer outcrops to the earth surface, comprising:

continuously, uni-directionally removing a strip of overburden exposing the outcropped mineral layer and mining the mineral product from said layer;

laying extensibly a slurry pipe and a water pipe from a preparation facility along the mined strip;

slurrying said mined mineral product with water for introduction to said slurry pipe and transport to the preparation facility; and

continuously placing the removed overburden material behind the unidirectional advance and covering the slurry pipe and water pipe within the mined strip.

4,415,208

CUTTER BIT ASSEMBLY

Wynand M. Goyarts, Washington, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 31, 1981, Ser. No. 289,060
Int. Cl.³ E21C *35/18*
U.S. Cl. 299—91 **12 Claims**

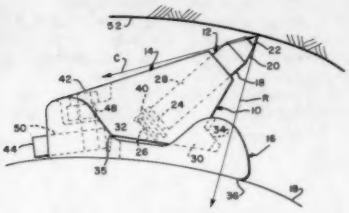
1. A cutter bit assembly adapted to be mounted on a drum for cutting with rotation in a selected direction comprising:

(a) an elongated cutter bit;

(b) a bit holder having a tapered locking lip positioned at the end of the bit holder toward the direction of rotation of the cutter bit assembly and a tapered surface positioned near the end opposite to the direction of rotation and tapered in a selected direction;

(c) a first locking means for removably affixing the elongated cutter bit to the bit holder;

(d) a bit block having an engaging section for contacting the tapered locking lip and an engaging surface for contacting the tapered surface at a selected angle whereby the force applied to the bit block during operation forces the engaging surface and the tapered surface to provide a locking action between the tapers; and



(e) a second locking means for removably affixing the bit holder to the bit block.

4,415,209

AN INTEGRAL WHEEL BRAKE CYLINDER AND PRESSURE REGULATING VALVE

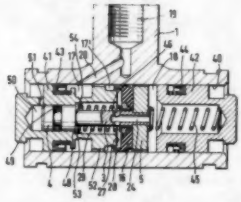
Bernd Schopper, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,394

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049079

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **9 Claims**



1. A pressure regulating valve for hydraulic brake systems for vehicles comprising:

a wheel brake cylinder housing having a first bore therein coaxial of a longitudinal axis;

at least a first wheel brake cylinder piston disposed in said first bore coaxial of said axis, said first piston and said first bore defining an inlet chamber connected to a master cylinder inlet;

a stepped pressure regulating piston having a smaller diameter section slidable in a second bore disposed in said first piston coaxial of said axis and a larger diameter section slidable in said first bore, a first surface of said larger diameter section remote from said smaller diameter section providing a first boundary for an outlet chamber, said larger diameter section having a third bore therein coaxial of said axis coupling said inlet chamber with said outlet chamber;

a valve arrangement to open and close said third bore including a sealing ring disposed on a second surface of said larger diameter section of said stepped piston parallel to said first surface adjacent said smaller diameter section of said stepped piston and an end surface of said first piston adjacent said sealing ring; and a first spring, acting on said stepped piston, disposed between said sealing ring and said first piston.

4,415,210

ARRANGEMENT FOR CONTROLLING THE PRESSURE IN BRAKE ACTUATING CYLINDERS OF A VEHICLE

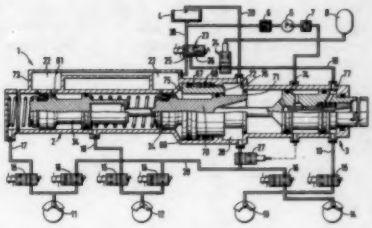
Juan Belart, Walldorf; Jochen Burgdorf, Offenbach-Rumpenheim; Dieter Kircher, Frankfurt am Main; Lutz Weise, Mainz, and Hans-Wilhelm Bleckmann, Obermoerlen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,819

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040561

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—116 **25 Claims**



1. An arrangement for controlling the pressure of a hydraulic braking fluid in brake actuating cylinders incorporated in a hydraulic braking system, especially that of a motor vehicle, having antiskid control equipment and a supply reservoir, in dependence on the position of a brake operating member movable from a rest position into a plurality of operating positions, comprising

a master cylinder device including a housing component defining at least one bore and having at least one inlet port communicating with said bore, and at least one master piston received in said bore for movement axially thereof;

means for replenishing the supply of hydraulic fluid in said bore, including an auxiliary source of pressurized hydraulic fluid, means defining at least one replenishment space communicating with said inlet port, and first and second connecting means for respectively connecting said replenishment space with said auxiliary source and with the reservoir;

means for establishing communication between said replenishment space and said first connecting means only during the control action of the antiskid control equipment; and

means for interrupting communication between said replenishment space and said second connecting means at least during the control action.

4,415,211

BRUSH HOLDER

Tacko Alissandratos, P.O. Box 606, Tarpon Springs, Fla. 33589

Filed Nov. 12, 1981, Ser. No. 320,372

Int. Cl.³ A47B *17/00*; A47G *19/26*

U.S. Cl. 312—206 **3 Claims**

1. An improved wall mounted enclosure device for mounting at least one brush and the like to a wall surface comprising:

a back housing,

said back housing including a recessed cavity formed by side, bottom, and top walls, said side walls converging toward each other from said bottom walls toward said top wall, a flange extending outwardly from said top, bottom and side walls in the same vertical plane, said flange including mounting apertures therein;

a recessed brush holder enclosure door rotatably supported by said rear housing;

said enclosure door including top and bottom horizontally extending parallel flanges, said top flange including an aperture therein, said bottom flange including a down-

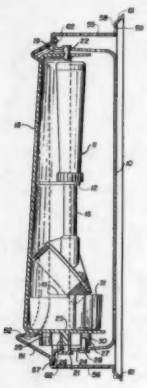
wardly extending first pivot pin for mounting said enclosure door to said back housing for pivotable motion therein, and spaced ribs extending downwardly from said bottom flange and equally spaced from said first pivot pin;

a second pivot pin extending through said top wall of said rear housing into said aperture in said enclosure door and a bushing extending through said bottom wall of said rear housing for receiving said first pivot pin for pivotably mounting said enclosure door within said back housing and said front enclosure; and

an unexposed stop means extending upwardly from said bottom wall of said rear housing for cooperating with said spaced ribs on said enclosure door for positioning said enclosure door in either an open or closed position, at least one shelf rigidly supported by said enclosure door and extending across the recess therein for securing at least one brush on said recessed brush holder enclosure door;

the improvement comprising:

an outer housing arranged relative to said back housing and said enclosure door,



said outer housing including a central opening formed by an outwardly extending wall on an angle relative to a vertical wall, and an inwardly extending wall extending toward a plane formed by said vertical wall, said central opening converging toward the top portion and partially enclosing said enclosure door;

said outer housing including top, bottom and side walls extending from said vertical wall, that surrounds said back housing;

said top, bottom and side walls including outwardly extending flanges for securing said outer housing to a wall surface; and

means for securing said back housing to said outer housing;

whereby said back housing may be secured to said outer housing and said outer housing may be secured to a wall with said back housing unexposed wherein said outer housing encloses said rear housing and said at least one brush when said brush holder is in the closed position and exposes said at least one brush when said brush holder is in the open position.

4,415,212

CONNECTOR RECEPTACLE FOR PRINTED CIRCUIT BOARDS

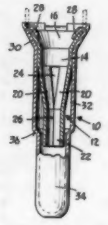
Lawrence V. DePillo, Waterbury, Conn., assignor to Mark Eyelet & Stamping, Inc., Wolcott, Conn.

Filed Sep. 21, 1981, Ser. No. 304,369
Int. Cl.³ H01R *9/09, 13/11*
U.S. Cl. 339—17 C **10 Claims**

1. A connector receptacle for insertion in an opening of a printed circuit board to receive a contact pin of a cooperable connector, comprising in combination:

(a) a tubular shell adapted to fit into said opening, said shell having at one end a leading portion of reduced diameter adapted to loosely fit into and enter the opening in a circuit board, and having at its opposite end an open mouth portion and external shoulder means at said mouth portion, constituting a stop which is engageable with the circuit board after the shell has been inserted therein,

(b) a spring contactor constituting a piece separate from the shell, said contactor being disposed in said shell and adpated for engagement with said contact pin of the cooperable connector, and



(c) an external resilient bowed spring retainer finger on the shell, extending lengthwise thereof along its exterior and toward the leading end portion thereof, for engagement with the circuit board to maintain the shell in the opening thereof against inadvertent dislodgement therefrom,

(d) said retainer finger having a free end which terminates short of the extremity of said leading end portion of the shell and is adapted to enter the opening in the circuit board ahead of the rest of the finger, and being integral with the shell and movable independently of the shell, and further being integrally connected to the open mouth portion of the shell,

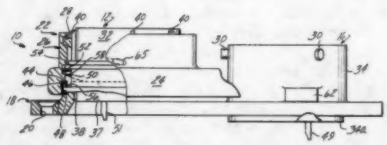
(e) said free end being disposed at a location beyond the board when the receptacle is fully seated.

4,415,213

HERMAPHRODITE ELECTRICAL CONNECTOR

Stephen Punako, and David W. MacAvoy, both of Bainbridge, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 2, 1981, Ser. No. 317,210
Int. Cl.³ H01R *13/625*
U.S. Cl. 339—49 R **1 Claim**



1. In combination with a hermaphrodite electrical connector of the type including a base plate and side-by-side socket and pin connectors, each of said socket and pin connectors including a generally cylindrical connector shell extending from said base plate; a coupling ring received over one of said connector shells, said coupling ring formed with a cam thread adapted to engage a projection carried by a connector carried by a mating hermaphrodite electrical connector; said engagement of said cam thread and said projection producing relative axial travel of said mating connectors on said mating hermaphrodite electrical connectors upon rotation of said coupling ring, to bring said mating connectors into engagement; each of said connector shell and said coupling ring having structure defining an

intervening annular recess; an annular wave washer disposed within said annular recess, said wave washer having a series of axially extending waves formed therein disposed engaging said structure of said coupling ring and said connector shell to create a frictional force acting on said coupling ring and said shell to enable frictional positioning of said coupling ring on said connector shell, characterized by a plurality of stops carried by said coupling ring and extending within said recess and interposed between the waves of said wave washer and limiting the relative axial travel to that less than the axial depth of said wave washer whereby over-stressing said wave washer is prevented.

4,415,214

ELECTRICAL PLUG AND SOCKET CONNECTORS

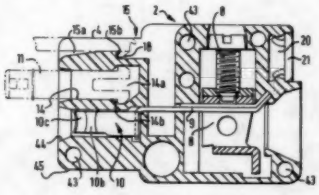
Rudiger Obst, deceased, late of Detmold, Fed. Rep. of Germany (by Martha L. Obst, administrator), assignor to C. A. Weidmuller GmbH & Co. Postfach, Detmold, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,089

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014804

Int. Cl.³ H01R *23/62*

U.S. Cl. 339—91 R **9 Claims**



1. An electrical connector comprising a multi-pole plug assembly and a multi-pole socket assembly, inter-engageable plug contacts and socket contacts in said plug and socket assemblies, respectively, and latching means for releasably securing together said plug and socket assemblies, wherein:

(a) said plug assembly comprises a plurality of mechanically interconnected individual plug units, disposed side by side and containing respective plug contacts;

(b) said socket assembly comprises a corresponding plurality of mechanically interconnected individual socket units disposed side by side and containing respective socket contacts, to mate with respective corresponding plug units of said plug assembly;

(c) each said unit includes a housing containing the respective said contact and provided with two receptacles, said receptacles in each plug unit being disposed to be aligned with the respective receptacles in the respective corresponding mating socket unit when the units are mated;

(d) at least one latching and coding pin is provided which is adapted to be mounted selectively in said receptacles and which is adapted to make latching engagement with a corresponding aligned receptacle or to constitute a coding means controlling the mating of said assemblies, according to the disposition of the pin or pins in said receptacles; and

(e) each pair of units comprising a plug unit and the mating socket unit has a first pair of aligned receptacles comprising a first receptacle in a first of said units adapted to retain a said pin mounted therein and a second receptacle in the second of said units adapted for latching engagement by a said pin mounted in said first receptacle; and a second pair of aligned receptacles comprising a third receptacle in said first unit and a fourth receptacle in said second unit, each of said third and fourth receptacles being adapted to retain a pin mounted therein but not to make latching engagement with a pin mounted in the respective aligned receptacle, whereby pins selectively mounted in said third and fourth receptacles can be used for coding said plug and socket assemblies.

4,415,215

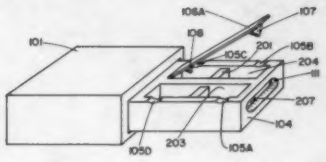
SOLDERLESS ELECTRICAL SPLICE

Calman Goozner, 415 Barlow Ave., Staten Island, N.Y. 10308

Filed Jun. 24, 1981, Ser. No. 276,883

Int. Cl.³ H01R *9/08*

U.S. Cl. 339—98 **4 Claims**



1. Apparatus for providing a rapid, secure and insulated electrical splice of the type in which a first and a second wire are electrically connected by solderless means, comprising:

(a) a body of insulating material, having a reference longitudinal axis and upper surface, the body also having a channel which passes through it in a direction substantially parallel to the longitudinal axis, the channel being exposed along the upper surface of the body, but not at the channel ends, the ends of the channel are exposed on surfaces other than the upper surface of the body by a first and a second opening designed to accept the first and second wires respectively into the lower portion of the channel away from the upper surface of the body,

(b) a generally flat, conductive interconnection bar extending substantially the width and length of the exposed portion of the channel in the upper surface of the body and oriented horizontally to present an upper and lower side, the bar being located in the upper portion of the channel with the underside of the bar facing downward into the channel, the bar having a first end adjacent the first opening and a second end adjacent the second opening,

(c) a first conductive prong, connected to and projecting downward from the lower side of the interconnection bar adjacent the first end, the tip of the first prong piercing the insulation of the first wire to make connection between the first wire and the bar and to secure the first wire within the channel,

(d) a second conductive prong connected to and projecting downward from the lower side of the interconnection bar adjacent the second end, the tip of the second prong piercing the insulation of the second wire to make connection between the second wire and the bar and thus to the first wire through the interconnecting bar,

(e) an insulating cover for the body which encompasses the body and extends over the exposed portion of the channel on the upper surface of the body to insulate the interconnection bar and secure it in place in the channel, the cover being slideably positioned about and off the body by movement generally in the direction of the longitudinal axis of the body,

(f) wherein said first and second prongs are formed of flat sheets oriented generally orthogonal to the reference longitudinal axis and each of said flat sheets contain an inverted "V" cut, forming a prong with two tips, the inside edges of the inverted "V" cut being sharp to pierce insulation and the inverted "V" cut accepting various wire sizes at the level in the "V" cut having a spacing between the inside "V" cut edges which corresponds to a particular wire diameter selected for connection and

(g) wherein said apparatus further comprises resilient material located in the lower portion of the channel to urge a wire inserted in the channel upwards into the inverted

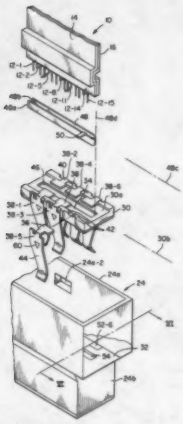
"V" cut to pierce the insulation with the "V" cut inside edges and to make connection with the prong.

4,415,216

CONNECTOR FOR MASS-GROUND TERMINATION OF MULTICONDUCTOR CABLE

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Mar. 3, 1981, Ser. No. 240,026
Int. Cl.³ H01R *4/66, 13/58*
U.S. Cl. 339—107 **20 Claims**



1. A connector for terminating bared ends of a multiconductor cable comprising housing means for receiving said cable and supporting said bared ends in first and second mutually non-aligned channels in said housing means, a plurality of electrical contact members supported in said housing means with bases of said contact members in registry with said first channel for connection with such bared ends therein, and with tails of said contact members accessible exteriorly of said housing means, a dual-walled conductive member supported in said housing means and defining a bounded portion of said second channel for connection with such bared ends therebetween, and interconnect means for connecting said electrically conductive means to at least one of said contact members.

4,415,217

CABLE JOINING CONNECTOR AND METHOD

Robin J. T. Clabburn, Menlo Park, and Rolf B. Stroessner, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

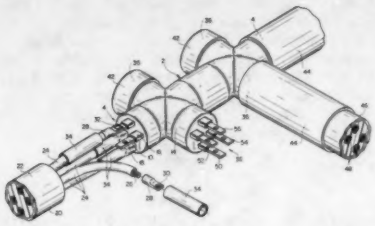
Filed Jul. 16, 1981, Ser. No. 283,843
Int. Cl.³ H01R *21/00*
U.S. Cl. 339—113 L **6 Claims**

1. A re-enterable cable jointing connector for electrical power distribution network cables having cores, comprising:

(a) at least two current carrying elements, each having at least three connection portions to which the individual cable cores may be attached, the connection portions of one current carrying element positioned adjacent to corresponding connection portions of other current carrying elements to define respective connector outlets, one for each cable to be connected;

(b) an electrically insulating body substantially surrounding the current carrying elements and extending at least up to the connection portions, the insulating body electrically insulating the current carrying elements from one another and interfacially isolating the cables to be attached from one another; and

(c) a plurality of electrically insulating extension layers, one for each connection portion, each layer extending from



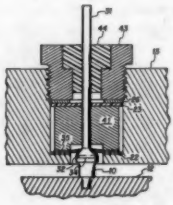
the insulating body and surrounding at least a portion of each connection portion.

4,415,218

SPRING LOADED DIODE CONTACT APPARATUS

Robert W. McKenzie, Lewisville, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 235,293, Feb. 17, 1981, abandoned.
This application Mar. 18, 1983, Ser. No. 476,890
Int. Cl.³ H01R *13/66*
U.S. Cl. 339—147 R **4 Claims**



1. Apparatus for establishing a highly reliable and stable electrical connection with a conducting surface of a circuit component, suitable for radio frequency circuit operation, comprising:

a conductor element having a surface for making electrical contact with the surface of the component as the conductor element is pressed along an axis against the component surface, and said conductor element further having a portion slated with respect to said axis;

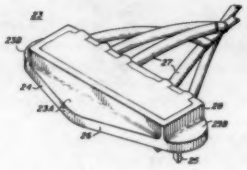
means for establishing plural, stable points of contact with said slanted portion of the conductor element, including a biasing member formed of resilient sheet material with a first opening for receiving the conductor element therethrough, and having additional open portions formed therein to define a plurality of resilient leaf projections extending toward said first opening; and

means for mounting said biasing member with the conductor element through said first opening thereof and with said biasing member disposed along said axis such that said leaf projections are deflected by and impart a force to said slanted portion of the conductor element, pressing said surfaces together.

4,415,219
CONNECTOR WITH REMOVAL STRESS RELIEF CONSTRUCTION

Virgil F. Kuhl, Tamarac, and Gary J. White, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1981, Ser. No. 292,305
Int. Cl.³ H01R *33/74*
U.S. Cl. 339—195 M **5 Claims**



1. An electrical connector assembly for association with lead wires and for insertion into a mating socket, said electrical connector assembly comprising:

a connector body having a top portion, a bottom portion and at least a first, second and third side portions, said first side portion receiving the lead wires,

conductive pins projecting from said bottom portion and having a certain characteristic yield strength,

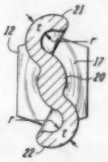
said second and third side portions disposed relative said first side portion to meet at a point approximately opposite the midpoint of said connector body first side portion to form a nose-like projection, said second and third side portions and said nose-like projection being disposed such that

a force exerted on said connector body first side in response to a pull on the lead wires causes said connector body to first pivot about said nose-like projection and then cam against the mating socket along either said second or third side portions resulting in the removal of said conductive pins from the mating socket without said pins experiencing a lateral force which exceeds their yield strength.

4,415,220
COMPLIANT CONTACT PIN

Rishi Kant, Budd Lake, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 29, 1981, Ser. No. 268,384
Int. Cl.³ H01R *9/16*
U.S. Cl. 339—221 R **7 Claims**



1. An electrical terminal pin having at least one end for receiving electrically conductive elements, and a compliant portion extending from said one end adapted for insertion in, and making electrical contact with a plated-through hole of an electrical component,

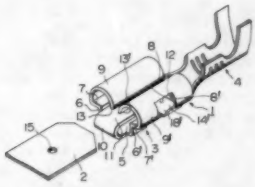
said compliant portion comprising in the lateral direction a solid cylindrical stem and a pair of oppositely directed, substantially C-shaped arms comprising sectors of cylindrical shells extending from said stem to present a substantially S-shaped cross section, and comprising in the axial direction a fully developed section and

a transition section linking said fully developed section with said end evolving from said S-shaped cross section at said fully developed section to a substantially elliptical cross section at said end, wherein the diameter of said solid cylindrical stem is a substantially constant, predetermined diameter throughout said fully developed section but which increases substantially linearly with respect to axial distance from said fully developed section, from said predetermined diameter at said fully developed section to a maximum diameter at said end, wherein the inner radius of each of said sectors is a substantially constant, predetermined radius throughout said fully developed section but which decreases substantially linearly with respect to axial distance from said fully developed section, from said predetermined radius at said fully developed section to a minimum radius of zero at said end, and wherein for any given cross section throughout said fully developed section and said transition section, the thickness of each of said sectors is not greater than the diameter of said solid cylindrical stem, whereby the compliance of said transition section decreases uniformly from a maximum at said fully developed section to a minimum at said end.

4,415,221
FEMALE TYPE ELECTRICAL CONNECTOR

Nori Inoue, and Shogo Katsuki, both of Yokkaichi, Japan, assignors to Tokai Electric Wire Company Limited, Yokkaichi, Japan

Filed Sep. 28, 1981, Ser. No. 306,499
Claims priority, application Japan, Oct. 1, 1980, 55-140611[U]
Int. Cl.³ H01R *13/633*
U.S. Cl. 339—258 F **3 Claims**



1. A female type electrical connector produced by stamping and bending of thin sheet metal comprising a receptacle section and a wire connection connected to the rear end of said receptacle section, said receptacle section comprising a tongue extending from the front end of said receptacle section toward the rear end thereof and formed with a locking projection on its upper surface and being pivotable on its front end to resiliently move downwardly, and two side walls each having a curved wall, the respective curved walls of said side walls extending from outside the opposite side edges of the tongue and curved upwardly to extend above the tongue and terminating at free ends which extend longitudinally and are juxtaposed to the upper surface of the tongue, said locking projection being adapted to engage a projection receiving portion of a male type electrical connector to lock the latter in place when the male type electrical connector is inserted between the upper surface of the tongue and the free ends of the two side walls and held therebetween, wherein the improvement comprises:

a pair of lugs projecting from the opposite sides of the tongue for moving the tongue downwardly, said lugs extending outwardly through windows formed in the two side walls respectively; and

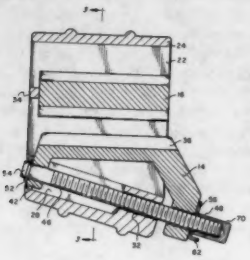
guide wall means for supporting the undersurface of the male type electrical connector when the latter is inserted in the receptacle section so that the underside of the male electrical connector may not move the tongue downwardly more than is necessary.

4,415,222

ELECTRICAL CONNECTOR

Mario Polidori, 1840 W. River Dr., Pennsauken, N.J. 08110

Filed Jan. 19, 1981, Ser. No. 225,833
Int. Cl.³ H01R *11/10*
U.S. Cl. 339—270 R **14 Claims**



1. An electrical connector particularly adapted to electrically and mechanically connect an electrical transmission conductor to a distribution conductor comprising:

a substantially C-shaped body member having a substantially flat rear wall and curved top and bottom walls, said top wall being adapted to fit partially around a transmission conductor;

a wedge movably secured to the inside of said body member adjacent said bottom wall, said wedge including an elongated upper surface thereon parallel to said top wall;

screw means for moving said wedge parallel to said bottom wall, said screw means being capable of moving said wedge into the interior of said C-shaped body and in the reverse direction so as to withdraw the same therefrom, the upper surface of said wedge being moved toward said top wall when said wedge is moved toward the interior of said body and away from said top wall when said wedge is withdrawn therefrom;

an elongated recess formed in the upper surface of said wedge, said recess being adapted to cooperate with the bottom surface of a distribution conductor, and

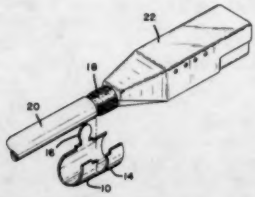
a removable elongated conductor interface insert within said C-shaped body, said insert having an upper surface adapted to contact the lower surface of said transmission conductor and having a lower surface adapted to cooperate with the upper surface of said distribution conductor.

4,415,223

INTERLOCKING CRIMP SLEEVE AND METHOD OF SECURING TO CONNECTOR

John C. Asick, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 3, 1981, Ser. No. 270,036
Int. Cl.³ H01R *4/20, 43/04*
U.S. Cl. 339—276 R **6 Claims**



1. In combination with an electrical connector having a housing of insulative material with a plurality of terminal passages extending therethrough, a like plurality of electrical terminals each mounted in a respective passage, a multi conductor cable having each conductor thereof secured to a respective terminal, and a crimp sleeve capable of being applied to the cable other than axially from a free end and of being crimped to secure said cable to said connector, said crimp sleeve characterized by:

an elongated strip of soft metal having interlocking profiles on the opposite ends thereof whereby said strip is applied to a previously terminated cable by folding it about said cable, interlocking said end profiles to form a substantially closed cylindrical crimp sleeve coaxially on said cable and crimping said sleeve to reduce the diameter thereof placing said interlocked ends under tension and said cable and connector under compression securing said cable to said connector.

5. The method of securing a cable to a connector which has been preterminated by the cable comprising the steps of:

forming a strip of relatively soft metal with interengaging profiles on the opposite ends thereof;

folding said strip about said cable bringing said opposite ends into interlocking engagement to form substantially a closed cylindrical sleeve; and

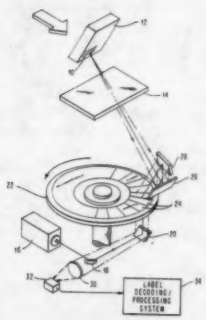
crimping said sleeve so as to apply tensile force to said interlocked ends and compressive force to said cable against said connector.

4,415,224

HOLOGRAPHIC SCANNER DISC WITH DIFFERENT FACET AREAS

LeRoy D. Dickson, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,344
Int. Cl.³ G02B *5/32*
U.S. Cl. 350—3.71 **10 Claims**



1. In a retroreflective optical scanner of the type having a coherent light beam source, a multifaceted, rotating holographic optical element for deflecting the coherent beam along predetermined scan lines and a photosensitive detector for detecting the level of light retroreflected from an object through a facet, the improvement which comprises making the facets have different areas to reduce the variations in light collection efficiency from one facet to the next.

4,415,225

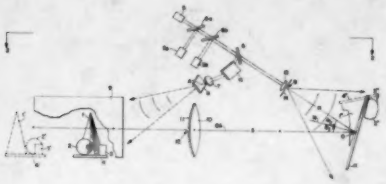
METHODS OF MAKING HOLOGRAPHIC IMAGES

Stephen A. Benton, Lincoln, Mass.; William R. Houde-Walter, Rochester, N.Y., and Herbert S. Mingace, Jr., Manomet, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 10, 1980, Ser. No. 205,758
Int. Cl.³ G03H *1/24*
U.S. Cl. 350—3.84 **20 Claims**

1. A process of making holographic images comprising the

steps of recording a hologram of a parallax limited aerial image formed by a lens on a first side of a recording surface with a reference beam directed toward the surface from a source on said first side of said surface at an angle of incidence to the



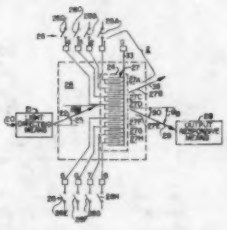
recording surface equal and opposite to the angle of incidence of the optical axis of the lens to the recording surface, and illuminating the hologram with a nonconverging beam of light directed toward the hologram from a source on a second side of said surface opposite said first side.

4,415,226

APPARATUS FOR CONTROLLING LIGHT IN ELECTROOPTIC WAVEGUIDES WITH INDIVIDUALLY ADDRESSABLE ELECTRODES

Carl M. Verber, Columbus, and Richard P. Kenan, Upper Arlington, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 31, 1980, Ser. No. 221,956
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.14 **58 Claims**



1. Apparatus for receiving light entering therein and controlling the directions in which portions of the light travel therethrough, comprising

input means for directing portions of the entering light in a predetermined input direction into a processing region in a waveguide,

control means for temporarily and separately changing the index of refraction in each of a plurality of subregions in the processing region by providing an electrical field in each subregion at selected times between a plurality of individually addressable interdigital electrodes therein, to modulate the light travelling thereto in approximately the predetermined input direction differently from any light travelling thereto in other input directions,

successive subregions being in close proximity and all of the digits in all of the electrodes therein being parallel, alternate digits throughout the processing region being connected together to form one common electrode shared by all subregions, the other digits in each subregion being connected together to form another electrode for that subregion only, and being insulated from all other electrodes, and

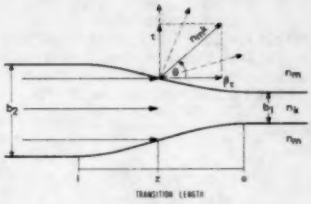
output means for receiving portions of the light travelling beyond the subregions in at least one selected output direction and for responding thereto.

4,415,227

TRANSITION BETWEEN TWO SINGLE MODE OPTICAL WAVEGUIDES

Hans-Georg Unger, Braunschweig, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 249,890
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012775
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.15 **5 Claims**



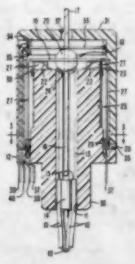
1. A connection piece connected for propagating light between two single mode optical waveguides having respectively different cross sections, said piece being in the form of a transition from one cross section to the other, the waveguides and said piece being composed of a transparent core member forming a light propagating path from one waveguide to the other via the transition, and a cladding material surrounding the core member, the core member part of said piece being formed to vary gradually and continuously in cross section in the direction of light propagation, and said piece having a length which is two to four times the free space wavelength of the light to be propagated divided by the difference between the index of refraction of the core member and the index of refraction of the cladding material.

4,415,228

OPTICAL FIBER SWITCH APPARATUS

Frank L. Stanley, Lancaster, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murry Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,521
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **8 Claims**



1. Optical fiber switch apparatus comprising a plurality of fixed first optical fibers having circularly arranged ends, an actuating member having circularly disposed bearing surfaces arranged to correspond to said circularly arranged fiber ends, said member being mounted to be tiltable about points around

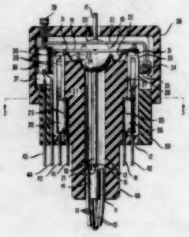
its periphery, a second optical fiber fixedly extending substantially centrally through said actuating member, said second fiber having a free end extending toward said ends of said first fibers substantially centrally thereof, a plurality of piezoelectric bimorph beams having ends circularly disposed respectively outside and under the periphery of said bearing surfaces of said actuating member, said beams being selectively energizable to deflect one of said beams under one of said bearing surfaces, and a piezoelectric bimorph plate fixedly mounted about its periphery and operable on said actuating member, said plate being energizable to cup said plate thereby to tilt said actuating member about a fulcrum presented by said one of said beams to swing said free end of said second fiber into alignment and abutment with the end of a selected one of said plurality of first fibers.

4,415,229

OPTICAL FIBER SWITCH APPARATUS

Harold E. McCullough, Blacklick, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murry Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,555
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **9 Claims**



1. Optical fiber switch apparatus comprising a plurality of fixed first optical fibers having circularly arranged ends, a magnetically responsive actuating member having circularly disposed bearing surfaces arranged to correspond to said circularly arranged fiber ends, said member being mounted to be tiltable about predetermined axes, a second optical fiber fixedly extending through said actuating member substantially at the intersection of said axes, said second fiber having a free end extending toward said ends of said first fibers substantially centrally thereof, and a plurality of first electromagnets having pole-pieces associated respectively with said circularly disposed bearing surfaces, said electromagnets being selectively energizable to tilt said actuating member about one of said axes thereby to swing said free end of said second fiber into alignment with the end of a selected one of said plurality of first fibers.

4,415,230

POLARIZATION RETAINING SINGLE-MODE OPTICAL WAVEGUIDE

Donald B. Keck, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

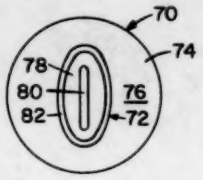
Filed Mar. 30, 1981, Ser. No. 248,947
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.33 **9 Claims**

1. A polarization retaining single mode optical waveguide fiber comprising

a core of transparent glass, said core having an oblong cross-sectional configuration,

an oblong inner cladding layer disposed on the surface of said core, said inner cladding including an optical cladding layer of high purity glass surrounded by a layer of lower purity glass, the refractive index of said core glass being greater than that of said high purity and said lower purity cladding glasses, and

an outer layer of stress cladding glass surrounding said inner



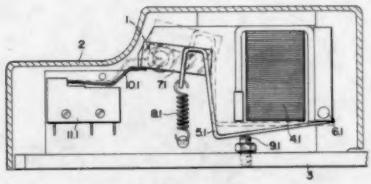
cladding, said stress cladding glass having a thermal coefficient of expansion different from that of said inner cladding glass, the outer surface of said outer layer being substantially circular in cross-section.

4,415,231

RADIATION SHUTTER, ESPECIALLY FOR A LASER

Friedrich Kaczensky, Putzbrunn; Walter Kroy, Ottobrunn, and Günter Reithmeier, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,658
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031908
Int. Cl.³ G05D 25/02
U.S. Cl. 350—269 **12 Claims**



11. A radiation shutter for substantially preventing a particle or radiation beam from passing from a source through a defined beam path, comprising housing means through which said defined beam path extends, first and second shutter means movably arranged in said housing in series as viewed in the direction of said beam path, first and second actuator means operatively connected to the respective shutter means for moving the shutter means into and out of said beam path, first and second position sensor means operatively arranged for sensing the position of the respective shutter means, and electrical circuit means operatively interconnecting said sensor means and said actuator means in such a manner that the position of the first shutter means causes the operation of the second actuator means and vice versa, and support means for movably supporting said first and second shutter means, said first and second position sensor means comprising first and second pressure responsive switches positioned to be actuated by a certain position of said first and second shutter means.

4,415,232

OPTICAL WAVEGUIDE SPLICE

Bernard G. Caron, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1981, Ser. No. 244,454
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 **6 Claims**

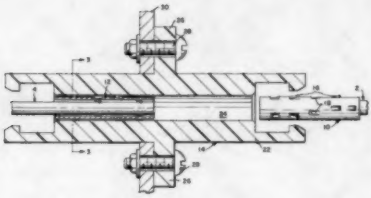
1. A retention member for retaining an end of a fiber optic

transmission member covered with cladding material within a bore of a receptacle member, comprising:

a sleeve member having a first series of inwardly-projecting tines angularly spaced around said sleeve member and a second series of outwardly-projecting tines angularly spaced around said sleeve member;

said inwardly-projecting tines extending in a forward direction to enable an end of a fiber optic transmission member to be inserted into said sleeve member with said inwardly-projecting tines resiliently biased against the cladding material, said inwardly-projecting tines penetrating the cladding material upon exertion of an axial force on the fiber optic transmission member in a rearward direction, thereby securing the end of the fiber optic transmission member in said sleeve member;

said outwardly-projecting tines extending in a rearward direction to enable the sleeve member to be inserted in a bore of a receptacle member with said outwardly-projecting tines resiliently engaging the bore surface, said outwardly-projecting tines plowing into the bore surface



upon exertion of an axial force on the fiber optic transmission member in a rearward direction thereby securing said sleeve member in said bore.

3. A fiber optic connector for connecting ends of fiber optic transmission members covered with cladding material, comprising:

receptacle means having bore means extending therethrough;

sleeve means secured onto the cladding material of the ends of fiber optic transmission members;

a first series of inwardly-projecting tines angularly spaced around said sleeve means, said inwardly-projecting tines extending in a forward direction in engagement with the cladding material thereby securing the ends of the fiber optic transmission members in said sleeve means;

a second series of outwardly-projecting tines angularly spaced around said sleeve means, said outwardly-projecting tines extending in a rearward direction in engagement with a surface defining said bore means thereby securing the ends of the fiber optic transmission members in said receptacle means in axial alignment.

4,415,233

ACHROMATIZED BEAM SPLITTER OF LOW POLARIZATION

Susumu Itoh, Tokyo, and Mitsuharu Sawamura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,659
Claims priority, application Japan, Feb. 5, 1981, 56/16221
Int. Cl.³ G02B *27/10, 5/28, 5/04*
U.S. Cl. 350—173 **5 Claims**

1. An achromatized beam splitter of low polarization comprising:

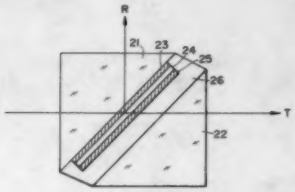
a transparent first prism;

a transparent second prism; and

a thin film group provided between said first prism and said second prism, said thin film group including, in succession from the first prism to the second prism,

a first dielectric material thin film layer being provided on the inclined surface of said first prism, said first layer being a mixture of titanium oxide and zirconium oxide;

a metal thin film layer provided on said first dielectric material thin film layer which consists of silver; and



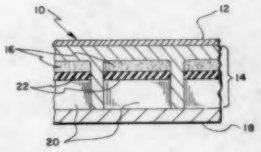
a second dielectric material thin film layer provided on said metal thin film layer, said second layer being a mixture of titanium oxide and zirconium oxide, said second layer having a film thickness substantially equal to that of said first dielectric material thin film layer.

4,415,234

PASSIVE COOLING OF MIRRORS

John J. Meyers, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,476
Int. Cl.³ G02B *5/08, 7/18*
U.S. Cl. 350—310 **4 Claims**



1. A mirror for high thermal energy application comprising:

(a) a substrate including means defining a chamber therein;

(b) gallium contained in said chamber; and

(c) an optical coating of high reflectivity supported by said substrate.

4,415,235

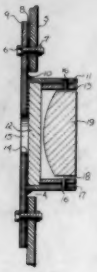
SIGHT GLASS/LENS MOUNTING ASSEMBLY

James H. Coates, 2125 2nd St., Douglas, Ak. 99824

Filed Jun. 12, 1981, Ser. No. 273,013
Int. Cl.³ G02B *7/02*
U.S. Cl. 350—319 **2 Claims**

1. A window and lens mounting assembly comprised of a face plate defining an aperture, a retaining ring holder secured to said face plate about said aperture, a window element within said retaining ring holder separated from said face plate by a compression gasket surrounding said aperture, a retaining ring within said retaining ring holder, means for securing said re-

taining ring to said retaining ring holder and pressing said retaining ring against said window element so as to compress



said compression gasket, and means for securing a lens within said retaining ring.

4,415,236

LIGHT DIFFUSING REFLECTOR FOR ELECTRO-OPTICAL DISPLAYS AND PROCESS FOR PRODUCING THEREOF

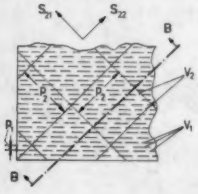
Alain Perregaux, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 925,762, Jul. 18, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 175,698

Claims priority, application Switzerland, Aug. 30, 1977, 10539/77

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—338 **4 Claims**



1. A reflector for liquid crystal displays formed of a foil with a diffuse reflecting surface, comprising:

first parallel furrow-shaped grooves aligned in a first detection, said first parallel grooves having a spacing between 2 and 20 μm and a maximal depth of 5 μm; and

at least second and third parallel furrow-shaped grooves aligned in a second and in a third direction, said at least second and third parallel grooves crossing said first parallel grooves and also each other, said second and third parallel grooves having a spacing between 150 and 500 μm and a maximum depth of 10 μm.

3. A process for producing a reflector for liquid crystal displays formed of a foil with a diffuse reflecting surface, comprising:

producing a first regular surface structure of first parallel furrow-shaped grooves on said foil by placing two foils each having a rough surface opposite one another with their rough surfaces facing each other, and then rolling said foils in a first direction, such that the so-formed first grooves have a spacing between 2 and 20 μm and a maximal depth of 5 μm, and

superimposing a second regular surface structure of at least second and third furrow-shaped grooves, which cross each other, on the foil with said first regular surface structure, by embossing said second structure by means of rolls, such that said second and third grooves cross said first grooves and have a spacing between 150 and 500 μm and a maximal depth of 10 μm.

4,415,237

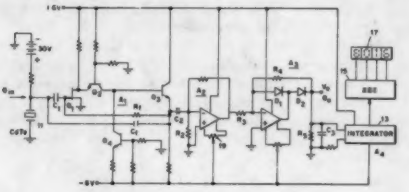
RADIATION DOSIMETER

Richard J. Fox, Oak Ridge, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Wash., D.C.

Filed Sep. 1, 1981, Ser. No. 298,448

Int. Cl.³ G01T *1/22*

U.S. Cl. 250—370 **5 Claims**



1. A radiation dosimeter, comprising:

an ionizing radiation detector which produces output signals at an output thereof in response to the charge collected due to the occurance of ionizing events within the sensitive region of said detector;

a charge amplifier means for detecting and amplifying said signals at said output of said detector which are proportional to said collected charge;

a charge storage capacitor connected to the output of said amplifier means;

a resistor connected in parallel with said capacitor for controlling the discharge rate of said capacitor at a selected value;

and

an integrator means connected to the output of said charge amplifier means for time averaging the discharge current of said capacitor to generate an output signal at an output thereof proportional to the radiation dose-rate detected by said detector.

4,415,238

SINGLE LENS HAVING ONE SPHERICAL AND ONE ASPHERICAL REFRACTIVE SURFACE

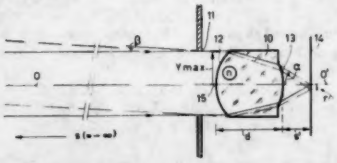
Josephus J. M. Braat; Jan Haisma, and Gijsbert Prast, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1981, Ser. No. 307,717

Claims priority, application Netherlands, Jul. 13, 1981, 8103323

Int. Cl.³ G02B *13/18*

U.S. Cl. 350—432 **1 Claim**



1. A single lens having one spherical and one aspherical refractive surface, characterized in that the spherical refractive surface and the aspherical refractive surface are in a relationship with each other which is represented by a set of straight lines

$$\frac{c_2}{c_1} = a\left[\frac{d}{(n-1)f}\right] + b \text{ for } 1.00 \leqq \frac{d}{(n-1)f} \leqq 1.35$$

in which the expressions for a and b are:

$$a = 4.85\,(NA) - 0.32\,n - 2.39$$

$$b = -4.10\,(NA) + 1.20\,n + 0.46$$

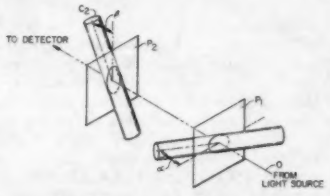
where c_1 is the curvature of the aspherical surface at its intersection with the optical axis, c_2 is the curvature of the spherical surface, d is the thickness of the lens, n is the refractive index, f is the focal length and NA is the numerical aperture, while $0.3 \leqq NA \leqq 0.5$; $1.5 \leqq n \leqq 2.0$ and the magnification $V \leqq 0.1$.

4,415,239

REFLECTION REJECTION SPHERICAL OPTICAL TRAIN COMPOSED OF TIPPED LENS ELEMENTS

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Oct. 31, 1980, Ser. No. 202,534
Int. Cl.³ G02B *13/08, 3/06*
U.S. Cl. 350—433 **8 Claims**



1. A reflection rejecting focusing optical train, comprising:
at least two optical elements, each of said optical elements being a cylindrical lens;
said optical elements disposed along an optical axis;
the optical elements being crossed one with respect to another so that the total and combined optical power output of all said elements along said axis is equivalent to that of an overall spherical lens;
each of said optical elements tilted with respect to a plane normal to the optical axis, said tilt disposing the near point of each optical element to one end of said optical train at equal angular intervals about said optical axis with respect to the near point of all the rest of said optical elements, whereby light is reflected out of the optical path of said optical element.

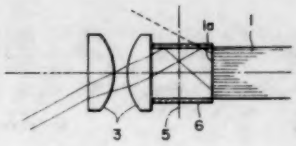
4,415,240

ILLUMINATION OPTICAL SYSTEM FOR AN ENDOSCOPE

Kimihiko Nishioka, and Nobuo Yamashita, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1980, Ser. No. 171,759
Claims priority, application Japan, Jul. 27, 1979, 54/95720
Int. Cl.³ G02B *5/14, 23/00*
U.S. Cl. 350—442 **13 Claims**

1. An illumination optical system for an endoscope comprising a light guide comprising a fiber bundle formed by bundling up a number of optical fibers each of which can transmit the light at the same time, a positive lens system disposed in front of said light guide, and a cylindrical reflection member comprising a mono-fiber arranged between the said lens system and an exit end face of the said light guide and having substantially the same diameter as the said light guide, an end face of the said mono-fiber at the lens side being a curved surface, and in which the radius of curvature R of the said curved surface satisfies the following formula:



$$|R| \geqq \frac{0.6\,Dc}{2\sin\left(\sin^{-1}\frac{1}{n} - \alpha_1\right)}$$

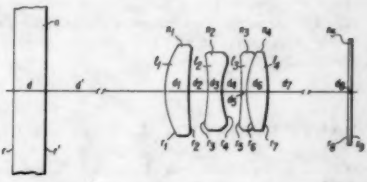
where
Dc is the diameter of the mono-fiber
n is the refractive index of the mono-fiber, and
α_1 is the angle formed by the ray having the widest angle of view with the axis of the mono-fiber, respectively.

4,415,241

TESSOR TYPE LENS SYSTEMS FOR FACSIMILE

Hiroichi Shinohara, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1980, Ser. No. 189,947
Claims priority, application Japan, Sep. 21, 1979, 54-121717
Int. Cl.³ G02B *9/20*
U.S. Cl. 350—476 **1 Claim**



1. A tessor type lens system comprising a first positive meniscus lens element, a second biconcave lens element and a third cemented doublet element consisting of a negative lens element and positive lens element, said lens system having the following numerical data:

γ =	∞	d =	13.158	n = 1.51633	ν = 64.1
γ^1 =	∞	d^1 =	1039.145		
γ_1 =	39.474	d_1 =	9.211	n_1 = 1.77250	ν_1 = 49.6
γ_2 =	394.832	d_2 =	6.711		
γ_3 =	−97.368	d_3 =	5.395	n_2 = 1.71736	ν_2 = 29.5
γ_4 =	34.697	d_4 =	7.369		
γ_5 =	−788.105	d_5 =	2.632	n_3 = 1.58144	ν_3 = 40.7
γ_6 =	47.368	d_6 =	8.158	n_4 = 1.83481	ν_4 = 42.7
γ_7 =	−66.426	d_7 =	84.174		
γ_8 =	∞	d_8 =	1.316	n_5 = 1.77250	ν_5 = 49.6
γ_9 =	∞				

f = 100, F/4.5

wherein:
γ_i represents the radius of curvature of the i-th refractive surface counted from the object side;
d_i represents the i-th axial distance (i.e., airspace or lens thickness) counted from the object side;
n_i represents the refractive index with respect to d-line of the i-th glass material counted from the object side;

ν_i represents the Abbe number of the i-th glass material counted from the object side;

f represents the focal length of the whole lens system.

4,415,242

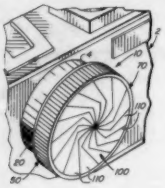
CAMERA LENS COVER AND SUNSHADE APPARATUS

Frederick A. Major, 1725 E. Ellis Dr., Tempe, Ariz. 85282

Continuation-in-part of Ser. No. 112,731, Jan. 17, 1980, abandoned. This application Jan. 29, 1981, Ser. No. 229,454

Int. Cl.[3] G02B *11/04*

U.S. Cl. 350—581 19 Claims



1. Cover and shade apparatus for a camera lens, comprising, in combination:

first ring means adapted to be secured to a camera;

second ring means disposed on the first ring means and movable relative thereto, and including cam means;

third ring means secured to the first ring means and disposed adjacent the second ring means, including

a petal ring,

petal means, including a plurality of petals secured to the petal ring and movable from a closed, cover positon to an open, shade position, and

means in each petal of the plurality of petals for engaging the cam means of the second ring means for moving the petals in response to movement of the second ring means.

4,415,243

OPTICAL TEST CHART FOR TESTING BINOCULAR READING ABILITY

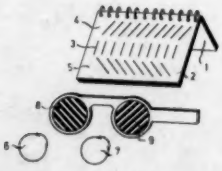
Heinz Gottlob, Königsbronn, and Horst Falk, Aalen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 331,909

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 8104761[U]

Int. Cl.[3] A61B *3/08, 3/02*

U.S. Cl. 351—201 7 Claims



1. An optical test chart for testing binocular reading ability for the viewing of which polarization filters with oppositely crossed directions of vibration are arranged in front of the eyes of a test subject, characterized by the fact that a plurality of sheets (2) bearing lines of letters of different size are arranged interchangeably on a support (1); that at least one line (4, 5) formed of polarizing letters is arranged on each sheet (2) above and below a first line (3) formed of non-polarizing letters; and that the directions of polarization in the lines (4, 5) lying above and below the first line (3) are crossed with respect to each other.

4,415,244

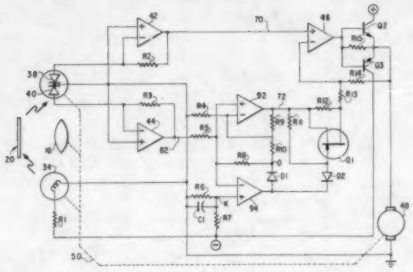
AUTOMATIC FOCUSING SYSTEM

William T. Daly, Rochester; Boris Gelman, Fairport, and William R. Sanderson, Rochester, all of N.Y., assignors to Telex Communications, Inc., Minneapolis, Minn.

Filed Mar. 22, 1982, Ser. No. 360,258

Int. Cl.[3] G03B *3/00*

U.S. Cl. 353—101 6 Claims



1. In a projector including a projection lens with a focal plane located a predetermined distance therebehind, said projector being adapted to project a series of slides, each of which comprises a film held in a mount defining an image area to be projected along the projection axis of said lens, and wherein the image area of said slide establishes an image plane when said slide is positioned at a projection station for projection thereof, the projector further including a base, a carriage mounted on said base for movement relative thereto, means for adjustably mounting said lens for movement with said carriage and for relative movement with respect to said carriage to establish a preferred condition of coincidence of said image and focal planes so that the projection of the image area through said projection lens onto a viewing surface is optically focused for viewing thereof, and reversible drive means operably connected to move said carriage relative to said base and said image plane in a direction substantially parallel to said projection axis, an automatic focusing system comprising:

a source of radiant energy;

means for directing radiant energy from said source to said image plane;

a radiant energy detector including first and second radiant energy sensitive elements adapted to receive radiant energy reflected from said image area at said image plane, during said preferred condition of coincidence of said focal and image planes said first radiant energy sensitive element receiving more radiant energy than said second radiant energy sensitive element when an open film slide is positioned at said projector station and said second radiant energy sensitive element receiving more radiant energy than said first radiant energy sensitive element when a glass covered film side is positioned at said projection station, more radiant energy being reflected by a glass covered film slide than by an open film slide, and each of said radiant energy sensitive elements providing respective output signals related to the amount of radiant energy individually received thereby;

means for coupling at least one of said radiant energy source and said radiant energy detector to said carriage for movement therewith; and

non-linear energizing means for receiving said output signals and effective to energize said reversible drive means in response to both the absolute and relative levels of said output signals so as to move said carriage to establish said preferred condition of coincidence of said focal and image

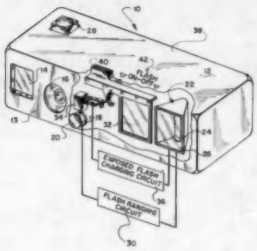
planes independent of whether an open film slide or a glass covered film slide is positioned at said projection station.

4,415,245

MOVABLE INFRARED FILTER FOR AN AUTO RANGING CAMERA

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 17, 1982, Ser. No. 378,670
Int. Cl.³ G03B *3/00, 15/03*
U.S. Cl. 354—25 **4 Claims**



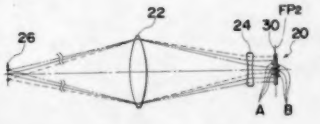
1. In a photographic camera including:
an electronic flash device;
a first circuit for firing the flash device for distance-measuring only;
a second circuit means for firing the flash device for producing a flash exposure; and
an infrared filter;
means providing relative movement between the filter and flash device for allowing said filter and said flash device to be selectively located in and out of alignment with one another, the improvement comprising:
switch means responsive to said relative movement for enabling the second circuit means when the filter and the flash device are out of alignment and for disabling the second circuit means when the filter means and the flash device are in optical alignment.

4,415,246

FOCUS DETECTING DEVICE

Toshihiko Karasaki, Sakai; Takayuki Gotoh; Yasuhiro Namba, both of Osaka, and Eiji Yamakawa, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 10, 1982, Ser. No. 387,201
Claims priority, application Japan, Jun. 11, 1981, 56-90351
Int. Cl.³ G03B *3/10*; G01J *1/44*
U.S. Cl. 354—25 **10 Claims**



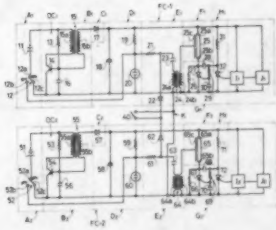
1. A focus detecting device for detecting a focusing condition of an objective lens on a predetermined focal plane by means of detecting a contrast of an image formed by said objective lens comprising:
an elongated cylindrical lens element having an axis extending in the elongated direction of said cylindrical lens, said cylindrical lens located between said objective lens and said predetermined focal plane such that said axis of said cylindrical lens is extending perpendicularly to an optical axis of said objective lens;
a light receiving unit comprising at least first, second, third and fourth photodiode arrays, and means for supporting said first to fourth photodiode arrays;
said first photodiodes array having a plurality of first photodiodes located on a first plane parallel to said predetermined focal plane, said first photodiodes being arranged, closely adjacent to each other, along a predetermined direction perpendicular to said axis of said cylindrical lens;
said second photodiode array having a plurality of second photodiodes located on a second plane parallel to, but apart from said first plane, said second photodiodes being arranged, closely adjacent to each other, along said predetermined direction;
said third photodiode array having a plurality of third photodiodes located on said first plane, said third photodiodes being arranged, closely adjacent to each other, along said predetermined direction;
said fourth photodiode array having a plurality of fourth photodiodes located on said second plane, said fourth photodiodes being arranged, closely adjacent to each other, along said predetermined direction;
said first to fourth photodiode arrays being located alternately along a direction parallel to said axis of said cylindrical lens; and
means for detecting current flowing through said first to fourth photodiodes so as to detect said contrast.

4,415,247

ELECTRIC FLASH APPARATUS

Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 285,958
Claims priority, application Japan, Jul. 24, 1980, 55-101641
Int. Cl.³ G03B *7/16*
U.S. Cl. 354—33 **18 Claims**



1. In an electric flash apparatus comprising a first flash unit incorporated in a housing of a camera, a second flash unit adapted to be mounted externally of said housing, light quantity control means for controlling respective quantities of light produced by said first and second flash units such that a light quantity of said first flash unit is less than the light quantity of said second flash unit, said first and second flash units including respective triggering and flash timing circuits for energizing said respective first and second flash units, and means for controlling the flash duration of the first and second flash units so that durations of respective flashes of said first and second flash units are approximately the same, said electric flash apparatus further including flash driving circuit means for supplying driving signals to said first and second triggering circuits, and flash operation selecting means for selecting and energizing one or both of said first and second flash units.

4,415,248

EXPOSURE CONTROL APPARATUS

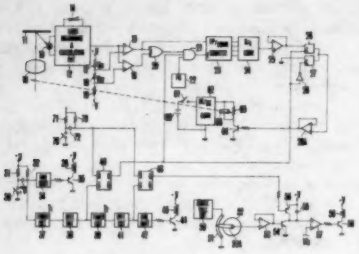
Ryoichi Suzuki, Kawasaki, and Takashi Uchiyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 231,782, Feb. 5, 1981. This application Jun. 9, 1982, Ser. No. 386,766

Claims priority, application Japan, Feb. 8, 1980, 55-15090

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—43 **9 Claims**



1. An exposure control apparatus for a photographic camera having a shutter and an electrically operated optical diaphragm arranged to have the aperture thereof controlled, said apparatus comprising:

light measuring means which is arranged to produce, during each exposure control cycle of the camera, an electrical signal corresponding to the brightness of an object to be photographed and instantaneously varying in accordance with the variations of the brightness of the object to be photographed during each exposure control cycle of the camera; and

control means coupled to the light measuring means and to said electrically operated optical diaphragm, said control means arranged to instantaneously make the aperture smaller when a light level of an object becomes brighter during an exposure control cycle of the camera and to instantaneously make the aperture larger when the light level becomes darker.

4,415,249

MOTOR DRIVE CIRCUIT FOR CAMERA

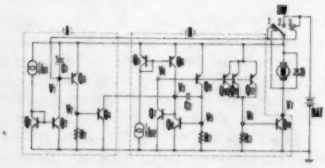
Hiroyoshi Tsuzuki, Yokohama, and Ryuji Tokuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Apr. 28, 1982, Ser. No. 372,792

Claims priority, application Japan, May 8, 1981, 56-69908

Int. Cl.³ G03B *1/18*; G05F *1/58*; H02P *7/00*

U.S. Cl. 354—173 **6 Claims**



1. A motor drive circuit having a battery as its first power source, comprising:

(a) a first transistor to control current flowing to a motor;

(b) second transistors to supply base current to said first transistor;

(c) a third transistor being so arranged as having a common base with said second transistors;

(d) a resistance to convert current flowing to said third transistor to a voltage;

(e) a fourth transistor to detect an output voltage of said resistance, said fourth transistor for comparing said output voltage of the resistance with a voltage across the base and the emitter thereof;

(f) a current source to supply current to the fourth transistor; and

(g) a fifth transisor to invert an output of said fourth transistor and supply the thus inverted output to the base of the third transistor and the second transistors.

4,415,250

FOCUSING SYSTEM FOR LONG FOCAL LENGTH OBJECTIVES

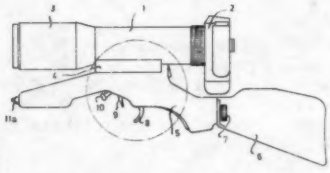
Dieter Rossmann, Aalen; Volker Donn, Königsbronn, and Christian Ludwig, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,240

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123084

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—195 **13 Claims**



1. A focusing system for long focal length objectives of the type connected to a camera by an intermediate tube containing a displaceable part movable to effect focusing of the objective, said focusing system comprising the combination with said tube of a first housing and a second housing, and means for interchangeably mounting either of said housings on said tube, each housing containing a focusing arm which, when the housing is mounted on the tube, engages said displaceable part of the tube to effect focusing of the objective, said first housing being in the form of a rapid setting grip having a hand operated member positioned for actuation by a finger of a hand grasping the grip, said member operating the focusing arm of said first housing, said second housing having fine adjustment mechanism for operating the focusing arm of the second housing.

4,415,251

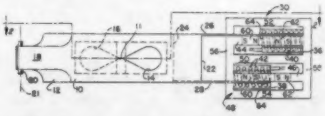
CAMERA SHUTTER HAVING BOBBIN DRIVEN BLADES

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 21, 1982, Ser. No. 341,555

Int. Cl.³ G03B *9/08*, *9/30*

U.S. Cl. 354—230 **15 Claims**



1. A light controlling blade and drive system for photographic apparatus, said system comprising:

a pair of apertured opaque blades defined by linear flights of a belt having a central bight portion trained about a fixed axis;

linear motor drive means including a fixed frame spaced from said axis, a pair of electromagnetic force driven movable members supported by said frame for reciprocation alternately in opposite directions; and

tensile means connecting said movable members to said blades for drawing said blades in opposite directions responsive to movement of said movable members.

4,415,252

ELECTROMAGNETICALLY OPERATED SHUTTER

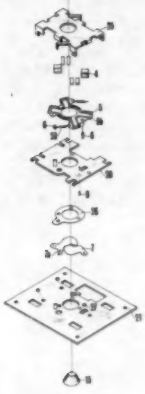
Michio Hirohata, Inagi, and Yukio Ogawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 114,497, Jan. 23, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,507

Claims priority, application Japan, Jan. 31, 1979, 54-9909; Jan. 31, 1979, 54-9910; Jan. 31, 1979, 54-9911

Int. Cl.³ G03B *9/22*

U.S. Cl. 354—234 **8 Claims**



1. An electromagnetically controlled shutter comprising:

a rotor for causing at least one shutter blade to open or close a photographic optical path by rotation through a predetermined angle, said rotor having a rotational axis and having two arms extending in radial directions with respect to the rotational axis of the rotor and being substantially symmetrically arranged with respect to the rotational axis of the rotor;

a conductor secured to the rotor and including a plurality of components extending radially with respect to the rotational axis of the rotor, said radial components being concentrated on respective arms of the rotor extending in the radial direction relative to the rotational axis;

a return spring for biasing the rotor in a direction to close the shutter and for increasing its return force by rotation of the rotor as the shutter aperture increases;

permanent magnets for forming a magnetic field in the direction of the rotational axis of the rotor and acting on the radial components of said conductive member, the polarity of said permanent magnets being arranged such that said magnetic fields and Lorentz forces produced by currents flowing in the radial directions of said conductive member act in the same direction relative to said rotor, said permanent magnets and the radial components being arranged relative to each other so that as a shutter blade opens the optical path, the overall length of said radial components in the magnetic field of the permanent magnet gradually increases and the Lorentz force on the rotor increases corresponding to the opening of the shutter blade.

4,415,253

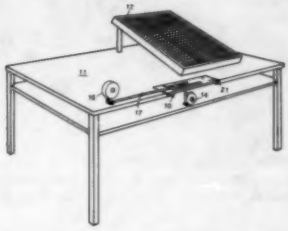
SYSTEM FOR SETTING SHEET-FORM TYPE

David S. Shew, 1402 Powell St., San Francisco, Calif. 94133

Filed Apr. 19, 1982, Ser. No. 369,349

Int. Cl.³ G03B *15/00*

U.S. Cl. 354—292 **2 Claims**



1. In a system of setting type in a medium suitable for photographing, the type elements being of generally rectilinear outline with a common width and having on at least one surface thereof a character visible for photographing, the type elements being formed from sheet material, the apparatus comprising, means for holding a supply of tape having on at least one surface a pressure-sensitive adhesive for securing type elements on the tape, take-up means for receiving tape having mounted thereon type elements adhesively secured thereto in a selected order for subsequent placement as camera ready copy, a base intermediate said tape support and said tape take-up means and serving to support a span of tape for placement of the type elements when the tape extends between said tape supply and take-up means, parallel guide means on said base serving to retain the tape laterally during placement of type elements thereon, said base having intermediate said guide means a tape receiving slot having a length substantially greater than the tape's thickness permitting the tape to be shifted longitudinally within the slot for manipulation and placement of the type element upon said tape, deflectable bridge means extending laterally of said guide means and arranged above said slot a distance so that deflection of said bridge means urges the sheet-like type elements into adhesive attraction with said tape, the edge of said bridge and the confronting sides of said parallel guide means defining a type loading station spaced from said slot so that a type element may be placed in the loading station and urged beneath said bridge into engagement with the adhesive tape surface for securing the type element to the tape in a flat, lineal order.

4,415,254

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH TRANSFER BIAS VOLTAGE STABILIZER

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 305,840

Claims priority, application Japan, Oct. 3, 1980, 55-137721

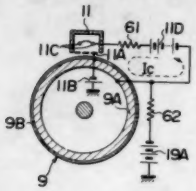
Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **2 Claims**

1. An electrophotographing copying apparatus in which an electrostatic latent image is formed on a charge retaining member carried by a conductive member and is developed with toner to provide a toner image, which image is transferred onto a record sheet by transfer means connected to a transfer bias source which has its terminal of the same polarity as the polarity to which the toner is charged connected to the conductive member, comprising:

a corona charger disposed in opposing relationship with the charge retaining member, a high tension source to cause a corona discharge from the corona charger, the high tension source having a first terminal connected to the conductive member and a second terminal connected to a corona dis-

charge wire of the corona charger, said transfer bias source connected between said first terminal and the ground, said



arrangement causing a corona current from the corona charger to flow between said conductive member and said first terminal and to bypass said transfer bias source.

4,415,255

OPTICAL COPYING ARRANGEMENT

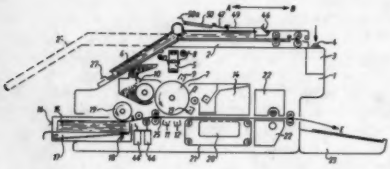
Hans-Peter Huber, Munich; Erich Burger, Unterhaching, and Horst Bickl, Pullach, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jan. 25, 1982, Ser. No. 342,171

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102293

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **16 Claims**



1. An optical copying arrangement, particularly an electrostatic copying arrangement, comprising a carriage provided with a supporting plate having an essentially transparent portion for an original having long and short sides, and being movable in a substantially horizontal direction, parallel to the short sides; means for moving an image carrier onto which an image is to be copied from the original, simultaneously with said carriage, a scanning system arranged to scan the original supported on said supporting plate by successive strips and form a copy on the image carrier, said supporting plate having a further part which in initial position of said carriage is located prior to a first strip, as considered in direction of movement of said carriage, and is bent downwardly relative to said transparent portion of said supporting plate in direction of movement for providing support for a portion of the original which is not copied so as to avoid displacement of the original on the transparent portion upon movement of said carriage.

4,415,256

APPARATUS FOR TRANSFERRING IMAGES

Takahiro Inoue; Yusaku Takada, both of Yokohama, and Takao Aoki, Abiko, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

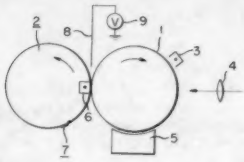
Filed May 24, 1982, Ser. No. 381,468

Claims priority, application Japan, Jun. 1, 1981, 56-84198

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **16 Claims**

1. Apparatus for transferring a developed image on an image bearing member onto a transfer material supported on transfer material bearing means, said transfer apparatus being characterized by the provision of transfer corona discharge means disposed opposed to the transfer position of the image bearing member; transfer material bearing means having a dielectric transfer material bearing surface and disposed to move the transfer material passing between said image bearing member and said transfer corona discharge means; and transfer material



attraction charge applying means disposed on the downstream side of said transfer position and in the space between the surface of said image bearing member and the transfer material bearing surface of said transfer material bearing means.

4,415,257

PRESSURE DEVICE FOR A WEB-LIKE IMAGE-RECEIVING MATERIAL

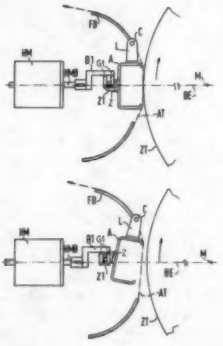
Walter Kopp, Taufkirchen; Hubert Mugrauer, Poering, and Anton Stuerzer, Grafing, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 2, 1982, Ser. No. 394,501

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128983

Int. Cl.³ G03G *15/16*

U.S. Cl. 355—3 TR **7 Claims**



1. A device for use in a transfer station of a non-mechanical printer or copier for moving a continuous web-like image-receiving material toward and away from an intermediate image carrier comprising:

a C-shaped pressure bar extending over the width of said image-receiving material and having an open side adjacent to said image-receiving material,

said pressure bar being pivotally connected to said guide plate at a point above said pressure bar, and having a means mounted on a rear of said pressure bar carrying a pin thereon;

a plunger-type solenoid; and

a linkage rigidly connected to the plunger of said solenoid and having a pair of parallel guides disposed perpendicular to the direction of displacement of said plunger of said solenoid, said guides defining a slot in which said pin is received permitting movement of said pin within said slot, whereby said open side of said pressure bar is urged against

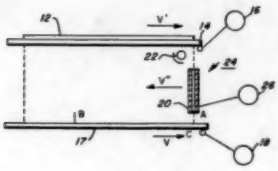
said image-receiving material when said solenoid is in a rest condition, and whereby said pressure bar is pivoted about said pivot point upon actuation of said solenoid and retraction of said plunger such that said pressure bar is moved away from said image-receiving material.

4,415,258

LINEAR LENS ARRAY IMAGING SYSTEM FOR FORMING REDUCED OR ENLARGED IMAGES AT AN IMAGE PLANE

James D. Rees, Pittsford, and John A. Durbin, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1982, Ser. No. 373,462
Int. Cl.³ G03G *15/28*
U.S. Cl. 355—8 **7 Claims**



1. An imaging system for projecting an erect image of a document lying in an object plane onto a photoreceptor lying in an image plane parallel to said object plane at at least one magnification m other than unity, said system including:

an imaging assembly positioned between said object plane and photoreceptor,

first drive means for driving said photoreceptor at a first velocity v,

second drive means for driving said document at a second velocity v′, and

third drive means for driving said imaging assembly at a third velocity v″, said first, second and third velocities being related by the expression

$$v' = \frac{v}{m} + v'' \frac{(1-m)}{m}$$

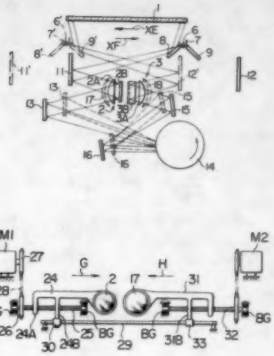
4,415,259

VARIABLE MAGNIFICATION AND RECIPROCAL EXPOSURE COPYING METHOD

Toyokazu Satomi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 19, 1981, Ser. No. 294,141
Claims priority, application Japan, Feb. 8, 1980, 55-114541
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—11 **20 Claims**

1. In a copying machine having scanning means adapted to be reciprocated back and forth relative an original for producing a light image of the original and directing said light image to a photoconductor through an inverting optical system during movement of said scanning means in one direction, and directing said light image to said photoconductor through an erecting optical system during movement of said scanning means in the other direction, means including an auxiliary lens movable along the optic path extending from the said original, through each said lens system and to said photoconductor for varying the magnification of the image directed to said photoconductor, and means for guiding a transfer sheet into engagement with said photoconductor by aligning a side edge of said transfer sheet with a reference position; the improvement including means associated with the movement of said auxiliary lens for shifting the inverting optical system in a direction normal to the optic axis thereof to shift the projected image on the photoconductor so that the image will be centered on the



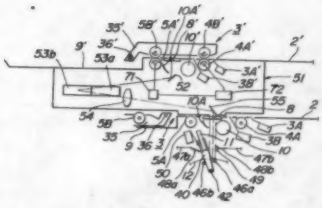
transfer sheet brought into engagement with said photoconductor.

4,415,260

DUPLICATING SYSTEM COMPRISING ELECTROPHOTOGRAPHIC COPIER AND OPTION DEVICE

Muneo Kasuga; Kiyoshi Miyashita, and Masaji Nishikawa, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,444
Claims priority, application Japan, Mar. 24, 1981, 56-41641
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **19 Claims**



1. A duplicating system comprising

an electrophotographic copying apparatus which includes first document detecting means for detecting a first document to be copied to produce a first document detection signal, first optical scanning means for making a slit exposure, first document feeding means for feeding the first document at a first speed with respect to said first optical scanning means in response to said first document detection signal, photosensitive means for forming an electrostatic latent image corresponding to the image of the document, and means for forming a duplicated copy with the aid of said latent image;

an option device which includes means for detachably mounting the option device onto the copying apparatus, second document detecting means for detecting a second document to be copied to produce a second document detection signal, second optical scanning means for making a slit exposure, second document feeding means for feeding said second document at a second speed with respect to said second optical scanning means in reponse to said second document detection signal, and optical

means for projecting the image of the second document onto said photosensitive means of the copying machine; and

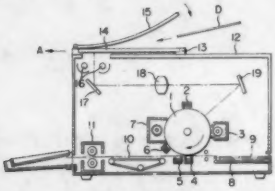
control means connected to said first and second document detecting means for inhibiting a document feeding operation of one of the first and second document feeding means in response to one of said first and second document detection signals for a given time period after the other of said first and second document detection signals is produced.

4,415,261

AN IMPROVED PLATEN COVER FOR A COPYING MACHINE

Koji Yukawa; Takashi Murahashi, and Isao Sakurai, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,587
Claims priority, application Japan, Sep. 26, 1980, 55-134979
Int. Cl.³ G03B *27/62*
U.S. Cl. 355—75 **5 Claims**



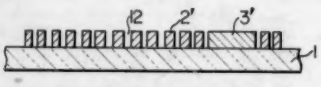
1. In a copying machine having a housing, a transparent plate on which an original to be copied is placed, and means for illuminated imaging of the original through the transparent plate and for reflecting an image of the original onto a photosensitive member, an improved platen cover for overlaying the original placed on the transparent plate, the improvement comprising markings on the surface of said platen cover facing the transparent plate and formed of a fluorescent-based material so that when scanning illumination impinging upon those of said markings disposed about the periphery of the overlaid original causes said markings to be reflected onto the photosensitive member, development of the reflected image of the fluorescent-based markings is avoided due to the high reflection characteristics of the fluorescent-based material and copy image integrity is accordingly maintained.

4,415,262

PHOTOMASK

Naoki Koyama, Kokubunji; Youji Maruyama, Hamuramachi; Hiroshi Umezaki, Mitaka; Norikazu Tsumita, Kodaira, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1982, Ser. No. 340,215
Claims priority, application Japan, Jan. 21, 1981, 56-6404
Int. Cl.³ G03B *27/28*
U.S. Cl. 355—125 **24 Claims**



1. A photomask comprising:

a plurality of mask portions of different light transmissivity for forming a plurality of photoresist pattern portions different in thickness through one exposure, said mask portions including at least one opaque pattern formed on a transparent substrate and having a predetermined form and at least one semi-transparent pattern,

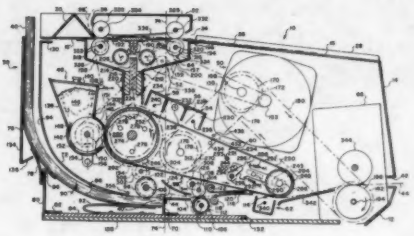
said at least one semi-transparent pattern being formed on said transparent substrate and having a predetermined form, said at least one semi-transparent pattern being formed of a finely apertured opaque film.

4,415,263

ELECTROPHOTOGRAPHIC COPIER APPARATUS

Lionel B. Hoffman, Wyckoff, N.J., assignor to Tetras S.A., Paris, France

Filed Oct. 22, 1981, Ser. No. 313,948
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **49 Claims**



1. A table top electrostatic copying machine comprising:

A. a housing for the machine having a top wall, a base, a front end wall, a rear end wall opposite the front end wall and opposite side walls,

B. an imaging system within the housing and comprising a flexible electrophotographic belt, rollers supporting the belt in a primarily horizontally extending elongate tensioned oval loop providing an upper and a lower reach, driving means for rotating at least one of the rollers for moving the belt in its loop, an exposure station adjacent the upper reach where a narrow strip-like pattern of light is adapted to be applied across the belt progressively to form a latent image across the belt and along the belt as it moves past the exposure station in a predetermined direction, a charging station including means for charging the belt surface across its width located adjacent the exposure station and upstream thereof whereby to charge the belt surface progressively just before the belt passes through the exposure station,

C. means for moving a patterned original member progressively along said top wall and means for projecting the illuminated pattern of said original member from said top wall into the interior of the housing and to said exposure station in synchronism with the movement of the belt whereby the illuminated pattern provide said narrow strip-like pattern of light selectively to discharge the charged surface progressively to form said latent image,

D. a toning station downstream of the exposure station and adjacent one of the said rollers having means for toning the latent image to develop the same on the belt surface progressively as the belt carries the latent image around said one roller and onto the lower reach of the belt,

E. an image transfer station adjacent the lower reach of the belt for transferring the developed image carried to the lower reach onto a sheet of carrier medium,

F. said rear end wall comprising an arcuate magazine arranged to hold a supply of carrier medium sheets, said magazine including an interior arcuate chamber for the supply of sheets and having a top entrance located generally at the juncture of the magazine with the top wall and presenting a vertical passageway into said chamber for receiving said supply, said magazine having a discharge port close to said base and spaced inwardly toward the front end wall away from a vertical plane which is substantially tangent to the magazine adjacent the top entrance, the discharge port providing a horizontal passage-

way for egress of sheets of carrier medium from said magazine, the chamber being smoothly curved from vertical to horizontal and arranged to hold said supply in a curved disposition,

G. means for stripping a single sheet from the supply of carrier medium sheets in the magazine at the discharge port and feeding the same to the image transfer station in synchronism with the movement of the belt and in timed relation to the developed image arriving from the toning station and

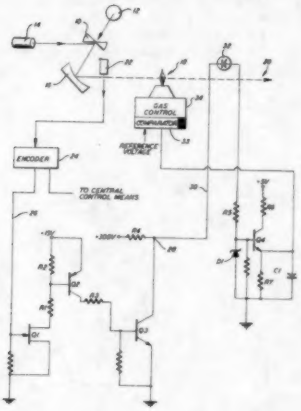
H. means for moving the sheet after it has passed through the transfer station out of the housing past the front end wall.

4,415,264

SPECTROPHOTOMETER GAS CONTROL SYSTEM

Charles M. Wittmer, Trumbull, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 25, 1981, Ser. No. 277,351
Int. Cl.³ F23N *5/08*; G01N *21/72*
U.S. Cl. 356—315 **6 Claims**



1. A spectrophotometer comprising, in combination:

a burner for burning a gaseous fuel and for atomizing a sample to be analyzed in a burner compartment;

means for periodically passing a beam of light through the burner compartment;

a detector;

means for energizing said detector during the period of absence of said beam of light through said burner compartment;

said detector being adapted when energized to produce an electronic signal representative of the presence or absence of a flame in said burner; and

means responsive to said electronic signal, for controlling the feeding of the fuel to said burner.

4,415,265

METHOD AND APPARATUS FOR AEROSOL PARTICLE ABSORPTION SPECTROSCOPY

Anthony J. Campillo, Nesconset, and Horn-Bond Lin, Manorville, both of N.Y., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

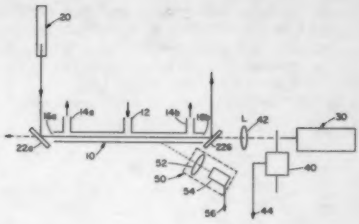
Filed Jun. 25, 1981, Ser. No. 277,442
Int. Cl.³ G01N *21/39*
U.S. Cl. 356—338 **15 Claims**

1. An absorption spectrometer apparatus comprising:

(a) a source providing a beam of light, said beam passing through a preselected region,

(b) a source providing a variable wavelength heating beam, said heating beam also passing through said region and said heating beam having a known spectrum,

(c) means for modulating said heating beam; and,



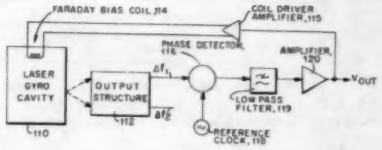
(d) means for detecting the intensity of light scattered from particles within said region, whereby the presence of particles having absorption bands within the spectrum of said heating beam may be detected by observation of the intensity of said scattered light.

4,415,266

PHASE-LOCKED LOOP LASER GYROSCOPE SYSTEM

James B. Matthews, Wayland, and Reno A. DeLuzio, Milford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 894,267, Apr. 7, 1978, abandoned. This application Sep. 5, 1980, Ser. No. 184,672
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **24 Claims**



1. In combination:

means for providing a closed-loop path for sustaining propagation of at least two circularly polarized counter-rotating electromagnetic waves of different frequencies;

means for providing a predetermined frequency difference between said two counter-rotating waves when said path is at rest;

means for producing an electrical signal having a frequency equal to the difference in frequency between said two counter-rotating waves;

phase detecting means for producing a signal as a function of the difference in phase between said electrical signal and a reference signal; and

means, coupled to the output of said phase detecting means, for providing an indication of the rotation rate of said closed-loop path.

4,415,267

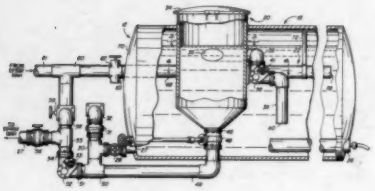
APPARATUS FOR MIXING AND APPLICATION OF PAVING COMPOSITIONS

Francis K. Hill, P.O. Box 2059, Wickenburg, Ariz. 85358

Filed Jun. 3, 1982, Ser. No. 384,577
Int. Cl.³ B28C *5/00*, *5/38*
U.S. Cl. 366—14 **16 Claims**

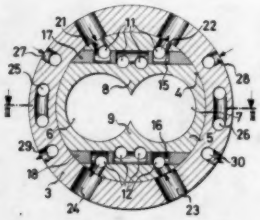
1. Apparatus for mixing an additive with molten paving material and for application of the resultant paving composition comprising:

(a) an application vehicle having a heated materials tank and an applicator means;
(b) means for admitting a quantity of the molten paving material to the interior of said heated materials tank from an external source;
(c) mixing means associated in heat transfer relationship with said heated materials tank and including,
I. molten paving material input means for admitting molten paving material from the interior of said materials tank into said mixing means,
II. additive input means for admitting the additive from an external source into said mixing means,



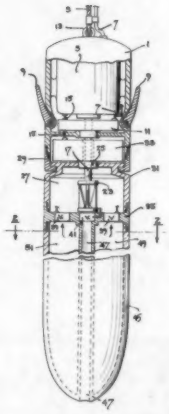
III. means in said mixing means for mixing the received molten paving material and the additive to produce the resultant paving composition,
IV. flow means for causing the received molten paving material and the additive to continuously flow through said mixing means during the mixing thereof and directing the resulting paving composition to the interior of said materials tank; and
(d) means coupled between said materials tank and said applicator means for selectively supplying the resultant paving composition thereto.

4,415,268
TWIN SCREW EXTRUDERS
Heinz Brinkmann, Bennigsen, and Siegfried Chszaniecki, Hanover, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany
Filed Jun. 10, 1981, Ser. No. 272,348
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 3023393
Int. Cl.³ B29B *1/10*
U.S. Cl. 366—85 **3 Claims**



1. A screw casing for a twin screw extruder for processing and shearing plastics, comprising:
(a) a cylindrical supporting member having an internal bore circular in cross section,
(b) a wear resistant liner positioned within and supported and reinforced by said supporting member, said liner having an external surface circular in cross section and fitting tightly within said bore of said supporting member, said liner being formed with two parallel longitudinal bores which overlap and form a combined spectacle shaped bore surface having two generally wedge shaped projections directed radially inwardly, said parallel bores being adapted to receive twin extruder screws for shearing and extruding plastic material,
(c) axially extending tempering passages formed in said wedge shaped projections, each of said tempering passages being disposed at approximately the same distance from the bore surface of the spectacle shaped bore so as to provide even tempering of such material, and
(d) additional axially extending tempering passages formed in said cylindrical supporting member at opposite sides thereof and laterally of the spectacle shaped bore, said additional tempering passage being independent of the first mentioned tempering passages and disposed at approximately the same distance from the bore surface of spectacle shaped bore so as to provide, together with said first mentioned tempering passages, even tempering of the material.

4,415,269
DEVICE FOR PROVIDING A REINFORCED FOAM LINING FOR WELL BORE HOLES
Ward M. Fraser, P.O. Box 217, Harbor City, Calif. 90710
Filed Apr. 28, 1981, Ser. No. 245,067
Int. Cl.³ B01F *3/08, 15/02*
U.S. Cl. 366—132 **2 Claims**



1. A device for mixing and dispensing foam components such as polyurethane foam components under pressure comprising:
an elongated cylindrical enclosure having at least three housings detachably arranged in coaxial end-to-end relationship and having an overall configuration capable of being lowered into a well bore;
a selected one of said housings disposed between the other two housings of said enclosure includes a mixing chamber containing an operable mixer;
one of said housings of said other two housings constituting a pair of pressure vessels enclosing a pair of pressurized storage chambers for storing fluids therein under pressure;
two operable valves, one located between the first of said pair of storage chambers and said mixing chamber and the other located between the second of said pair of storage chambers and said mixing chamber and each of said valves so oriented that fluid can flow from the adjacent storage chamber into said mixing chamber when the operable valve is in the open position;
said pressure vessel housing having a bore extending from said mixing chamber to the exterior of said enclosure at the extreme end of said pressure vessel housing;
operable valve means allowing mixed components to flow

from said mixing chamber exteriorly of said enclosure via said bore;

said other or remaining housing of said three housings mounting an electric power source operably coupled to said mixer;

switching and control means coupled to said electric power source, said fluid valve means and said mixer component valve means for operably controlling in a predetermined sequence; and

actuating means initiating the operation of said switching and control means when desired.

4,415,270

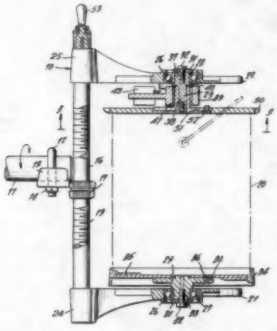
PAINT MIXER CONTAINER CLAMPING DEVICE WITH INERTIALLY DRIVEN CAN ROTATING FUNCTION

Robert P. Heinis, Totowa Boro, and Eric Vass, Clark, both of N.J., assignors to Red Devil Inc., Union, N.J.

Filed Oct. 18, 1982, Ser. No. 434,741

Int. Cl.³ B01F *11/00*

U.S. Cl. 366—216 **9 Claims**



1. A container clamping and rotating apparatus for a liquid mixing machine having an oscillating power output source comprising a clamp coupled to the oscillating power source, spaced container grasping jaws on said clamp, a first and a second container support plate freely journaled on the spaced jaws, inertial drive means carried by the clamp and operatively coupled to at least one of the container support plates to rotate the container within the jaws as the clamp is being oscillated and means to move the jaws toward and away from each other to grasp and release the container.

4,415,271

COMPACT ELECTRONIC DEVICE HAVING CALENDAR FUNCTION

Hiromitsu Mori, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 268,796

Claims priority, application Japan, Jun. 6, 1980, 55-76330; Jun. 6, 1980, 55-76331; Jun. 6, 1980, 55-76332

Int. Cl.³ G09G *3/00*; G04F *8/00*; G04B *47/00*

U.S. Cl. 368—41 **8 Claims**

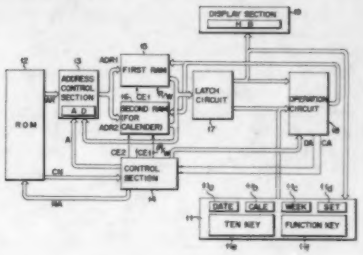
1. A compact electronic device having a calendar function comprising:

key input means having keys for setting initial data as a reference for setting a plurality of specified dates, keys for inputting setting data for setting a plurality of specified dates based on said initial data, and at least one key for setting a plurality of dates according to said initial data and said setting data;

temporary memory means coupled to said key input means for storing said initial data and said setting data input by said key input means;

judging means for judging the form of the initial data and the setting data stored in said temporary memory means and for issuing a corresponding judging signal;

specified date calculating means for calculating a specified date according to the judging signal of said judging means;



date memory means coupled to said specified data calculating means for storing a plurality of dates calculated by said specified date calculating means; and

visual display means for displaying a plurality of dates stored in said date memory means.

4,415,272

ELECTRICAL TIMEPIECE WITH HOUR-HAND ADJUSTMENT

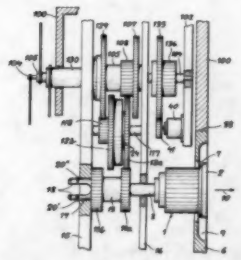
Hans Heinzelmann, Schramberg, Fed. Rep. of Germany, assignor to Kieninger & Obergfell Fabrik Für Technische Laufwerke und Apparate, St. Georgen/Black Forest, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,738

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3041040

Int. Cl.³ G04C *17/00*; G04B *17/12*

U.S. Cl. 368—69 **12 Claims**



1. A timepiece comprising:

a housing having a front wall and a rear wall;

a clockwork in said housing including a tubular hour shaft and a minute shaft coaxially projecting from said front wall;

a minute hand and an hour hand respectively carried on projecting extremities of said minute and hour shafts;

battery-operated drive means coupled with said clockwork for rotating said minute shaft, said clockwork including transmission means communicating the rotation of said minute shaft with a 1:12 step-down ratio to said hour shaft, said transmission means comprising a first gear positively coupled with said minute shaft, a second gear positively coupled with said hour shaft and yieldable detent means interconnecting said gears for joint rotation in any of a plurality of relative angular positions whose peripheral

spacing corresponds to a 30° travel of said hour hand with a given setting of said minute hand;

a manually rotatable setting member mounted in said housing for displacement in an axial direction parallel to said shafts between a first and a second terminal position; and

pinion means on said setting member meshing with said first gear in said first terminal position and with said second gear in said second terminal position for enabling adjustment of both said hands in said first terminal position and of said hour hand alone in said second terminal position, said detent means being effective in said first terminal position to entrain said hour shaft but being ineffective to transmit manual rotation of said second gear in said second terminal position to said first gear against the resistance of said drive means.

4,415,273

MICROPROCESSOR DRIVEN DIGITAL DISPLAY ALARM CLOCK

Harald Hoffman, Konigstein; Lothar Pacher, Mainz, both of Fed. Rep. of Germany; Peter Busch, Fenin, Switzerland, and Dan C. Raducanu, Bad Soden, Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

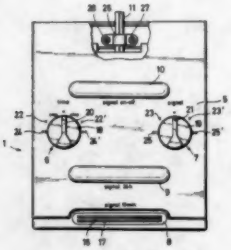
PCT No. PCT/DE80/00076, § 371 Date Jan. 27, 1981, § 102(e) Date Jan. 27, 1981, PCT Pub. No. WO80/02753, PCT Pub. Date Dec. 11, 1980

PCT Filed May 29, 1980, Ser. No. 233,617

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922621

Int. Cl.³ G04B *23/02, 1/00*; G04C *3/00*

U.S. Cl. 368—74 **10 Claims**



1. In an electronic clock provided with an alarm mechanism and capable of simultaneously displaying by electro-optical display means both a current time setting and an alarm time setting, that improvement which comprises:

first adjustment knob means for electronically adjusting said current time setting selectively either forward or backward at a selective plurality of predetermined rates by actuating said first adjustment knob means to one of a provided plurality of current time setting positions; and

second adjustment knob means for electronically adjusting said alarm time setting selectively either forward or backward at a selective plurality of predetermined rates by actuating said second adjustment knob means to one of a provided plurality of alarm time setting positions;

whereby a single knob provides convenient and rapid one-handed setting said current time and a single knob provides convenient and rapid one handed setting of said alarm time.

4,415,274

STEP MOTOR

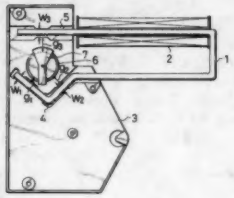
Akio Matsumoto, Neyagawa; Koichi Inazumi, Amagasaki, and Kazuhiro Araki, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 31, 1981, Ser. No. 297,621

Claims priority, application Japan, Sep. 12, 1980, 55-126807

Int. Cl.³ G04F *5/00*

U.S. Cl. 368—160 **22 Claims**



1. A step motor comprising a stator made by bending a bar-shaped material of a high magnetic permeability substantially into a U-shape, one leg of which being straight, a coil arranged on said straight leg of said stator and a rotor arranged between the straight leg and the other leg of the stator, said other leg being curved so that the closest part forming a gap between said rotor and said curved leg of the stator is angularly positioned spaced from a line extending normal from the rotary axis of the rotor to the closest part of the straight leg, and wherein the minimum distance forming the gap between the straight leg of the stator and the rotor being larger than the minimum distance forming the gap between the curved leg and the rotor.

4,415,275

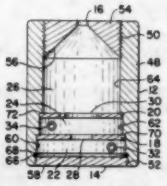
SWIRL MIXING DEVICE

David E. Dietrich, 8450-101 Via Sonoma, La Jolla, Calif. 92037

Filed Dec. 21, 1981, Ser. No. 332,949

Int. Cl.³ B01F *5/00, 15/02*

U.S. Cl. 366—165 **24 Claims**

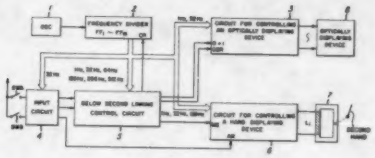


1. A device for mixing fluids comprising a container having a closed end and an exhaust; at least two fluid injection chambers within said container, a first one of said chambers being located between said closed end and the second one of said chambers; first passage means for fluid flow from said first to said second chamber; second passage means for fluid flow from said second chamber to said exhaust; first means for injecting a first fluid into said first injection chamber with a given angular momentum; and second means for injecting a second fluid into said second injection chamber with an angular momentum in the opposite direction to that of said first fluid.

4,415,276
ELECTRONIC TIMEPIECE

Yukio Ikehata, and Kenichi Ono, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 21, 1981, Ser. No. 295,010
Claims priority, application Japan, Aug. 25, 1980, 55-116737
Int. Cl.³ G04C 9/00
U.S. Cl. 368—187 12 Claims

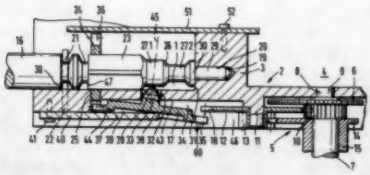


1. An electronic timepiece comprising: a time standard generator for generating a time standard output signal; a frequency divider for receiving the output signal from said time standard generator and having a resettable means and for producing a 1 Hz signal; first control means connected to said frequency divider to receive there from the 1 HZ signal for controlling an optically displaying device; second control means connected to said frequency divider to receive there from the 1 HZ signal for controlling a hand displaying device having a second hand; third control means connected to the resettable means of said frequency divider and including means for detecting the time of 10^{-1} seconds unit of said frequency divider and controlling said first control means and second control means in response to the content of said frequency divider; and input circuit means connected to said third control means and having switching means including at least one of a first switch for resetting the seconds indication of said optically displaying device to "00" seconds and a second switch for releasing the resetting state of said hand displaying device such that the content of said frequency divider is reset when one of the first switch and the second switch is operated and the seconds indication of said optically displaying device is linked to the seconds indication of said hand displaying device after one of the first switch and the second switch is operated.

4,415,277
TIME ADJUSTING MECHANISM FOR AN ELECTRONIC WRISTWATCH WITH A MANUAL ADJUSTING STEM

Wolfgang Ganter, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 360,922
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113019
Int. Cl.³ G04B 27/02
U.S. Cl. 368—190 9 Claims

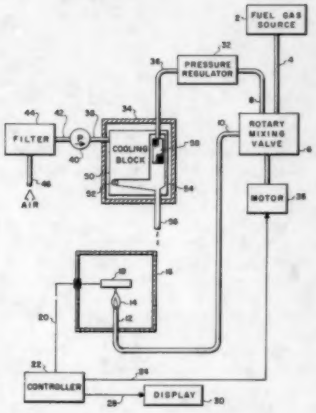


1. In an electronic wristwatch in which a rotatable correction wheel is moved into and from operative geared connection with a hands mechanism by means of an axially slidable setting shaft to determine the positioning of said correction wheel as a function of the axial placement of said shaft, the improvement comprising means mounting said correction wheel for tilting movement such that the axis of rotation of said wheel is inclined in a manner moving a force transmission portion of said wheel into and out of said geared connection with the hands mechanism in a direction generally parallel to the hands axis.

4,415,278
METHOD FOR OPERATING A GAS ANALYZING SYSTEM AND APPARATUS UTILIZING THE SAME

Eugene L. Szonntagh, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 8, 1982, Ser. No. 346,814
Int. Cl.³ G01N 25/22
U.S. Cl. 374—37 7 Claims



1. A gas analyzing apparatus comprising

a source of a fuel gas,

a source of combustion air,

ratio control means for producing a mixture of fuel gas and air in a selectively variable ratio, said means having a first and a second inlet and an outlet,

means connecting said fuel gas source to said first inlet of said ratio control means,

dehumidifying means connecting said source of air to said second inlet of said ratio control means to minimize water vapor entrained in the air from said source, said dehumidifying means including a cooling block having an internal labryinth air path, a cooling means including a thermoelectric cooler having a cold plate in thermal contact with said cooling block and a power supply for energizing said cooler and arranged to cool said cooling block below the dew point of air within said labryinth air path, but above the freezing point of water and a drain from said labryinth air path to remove condensed water from said cooling block,

combustion means connected to said outlet from said ratio control means for producing a combustion of said mixture of fuel gas and air,

sensor means for sensing combustion products from said combustion means to produce an output signal representative of the combustion state and

controller means arranged to respond to an output from said sensor means for controlling said ratio control means to produce substantially stoichiometric combustion of said mixture of fuel gas and air.

4,415,279
METHOD AND A METER FOR MEASURING QUANTITIES OF HEAT

Robert H. J. Beuse, Zevenaar; Han R. van Iterson, Oosterbeek; Jan W. Jansen, Brummen, and Petrus H. M. Wichern, Wijchen, all of Netherlands, assignors to N.V. Tot Keuring van Elektrotechnische Materialen, Arnhem, Netherlands

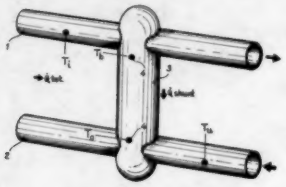
PCT No. PCT/NL80/00008, § 371 Date Nov. 17, 1980, § 102(e) Date Nov. 17, 1980, PCT Pub. No. WO80/02072, PCT Pub. Date Oct. 2, 1980

PCT Filed Mar. 21, 1980, Ser. No. 224,562

Claims priority, application Netherlands, Mar. 23, 1979, 79 02313

Int. Cl.³ G01F *1/68;* G01K *17/08*

U.S. Cl. 374—204 **16 Claims**



1. A method for measuring the quantity of heat abstracted from a circulating flow of liquid by a consumption unit of the type including the steps of indirectly measuring the volume flow rate of the liquid while maintaining a subsidiary heat flow with respect to the main heat flow transported by the flow of liquid, measuring the temperature at some points by means of temperature sensors, and computing said quantity of heat from said temperature measurements, characterized in that said determining volume flow rate of the liquid is made on the basis of the flow rate dependent heat transfer in the boundary layer of the flow of liquid at the location of the subsidiary heat flow and includes the steps of:

measuring the temperature differential ($\Delta T_{b,o}$) across a fixed heat resistance in a part of the path of the subsidiary heat flow outside the boundary layer thus establishing the subsidiary heat flow;

measuring the temperature differential ($\Delta T_{i,b}$) across the boundary layer; establishing indicia of the quotient ($\Delta T_{i,b}/\Delta T_{b,o}$) of the two temperature differentials;

measuring the absolute supply temperature (T_i) of the flow of liquid for correcting the temperature dependency of the material constants of the liquid;

measuring the temperature differential ($\Delta T_{i,u}$) of the flow of liquid across the consumption unit; and

determining said quantity of abstracted heat from said quotient ($\Delta T_{i,b}/\Delta T_{i,o}$), said absolute supply temperature (T_i) and the temperature differential ($\Delta T_{i,u}$) of the flow of liquid across the consumption unit.

4,415,280
HYDRODYNAMIC FLUID FILM BEARING

Giridhari L. Agrawal, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,314

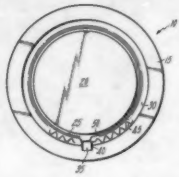
Int. Cl.³ F16C *32/06*

U.S. Cl. 384—103 **10 Claims**

1. A hydrodynamic fluid film journal bearing comprising a stationary retaining member, a rotatable journal defining with said stationary member, an annular spacing therebetween, a first smooth, generally cylindrical foil element disposed within said spacing, said journal being supported on a pressurized fluid film layer maintained by relative rotary movement between said journal and said first foil element, said journal bearing further comprising a generally cylindrical resilient backing member being disposed in said spacing generally concentric to, and radially outwardly from said first foil element, said resilient backing member accommodating deflection of said foil element due to pressurization thereof by said fluid film layer and excursions of said journal due to loading and imbalances thereof, said hydrodynamic fluid film bearing being characterized by:

said first foil element and said resilient backing member being fixed to said retaining member and extending thereabout in opposite circumferential directions, and

a second smooth, generally cylindrical foil element fixed to said retaining member and disposed in said spacing, radially inwardly of said resilient backing member and concentric to said first foil element and said resilient backing member,



whereby enhanced coulomb damping is effected by rubbing contact between said first foil element and resilient backing member in said opposite circumferential directions of extension thereof and by rubbing contact between said second smooth foil element and at least one of said first foil element and said resilient backing member in opposite circumferential directions of extension thereof.

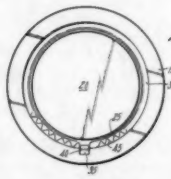
4,415,281
HYDRODYNAMIC FLUID FILM BEARING

Giridhari L. Agrawal, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,315

Int. Cl.³ F16C *32/06, 27/00*

U.S. Cl. 384—103 **6 Claims**



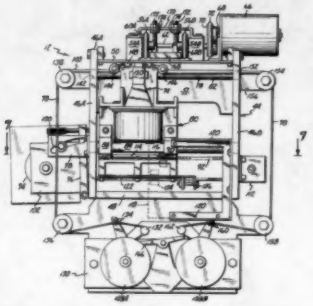
1. A hydrodynamic fluid film bearing comprising a stationary retaining member, a rotating member defining with said retaining member a spacing therebetween, a smooth foil element disposed within said spacing, said rotating member being supported on a pressurized fluid film layer maintained by the relative movement between said rotating member and said foil element, said fluid bearing further comprising a single resilient backing member accommodating deflections of said foil elements due to the pressurization thereof by said fluid film layer, said bearing being characterized by:

said single resilient backing member being of one piece unitary structure and having a bilinear spring rate including a first, lower spring rate for accommodating deflections of said foil element and excursions of said rotating member from lesser relative loading thereof for enhanced stability and damping, and minimal power loss and a second, higher spring rate for resisting deflections of said foil element and excursions of said rotating member from greater relative loading thereof for enhanced load capacity.

4,415,282
SLIDE MOUNT DATA PRINTER

Charles L. Euteneuer, St. Michael, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jan. 21, 1982, Ser. No. 341,299
Int. Cl.³ B41F *17/00*
U.S. Cl. 400—30 **20 Claims**



1. Apparatus for printing alphanumeric information on photographic slide mounts, the apparatus comprising:

a generally horizontal slide track along which the photographic slide mounts are intermittently advanced, the slide track having an entrance end and an exit end and including a printing station between the entrance end and exit end;

a pair of generally parallel conveyor belts positioned above and adjacent opposite sides of the slide track, the conveyor belts extending from the printing station toward the exit end of the slide track so that the conveyor belts engage a top surface of a slide mount to hold the slide mount in position between the belts and the slide track for printing at the printing station;

a carriage track aligned in a plane parallel to and below a plane defined by the slide track and running in a generally transverse direction to the slide track;

a carriage movable on the carriage track below the slide track;

a print head carried by the carriage for printing alphanumeric characters on a bottom side of a slide mount when the slide mount is positioned in the slide track at the printing station;

platen means positioned above the slide track and between the conveyor belts at the printing station for engaging the top surface of the slide mount when the print head is printing on the bottom surface of the slide mount;

carriage drive means for moving the carriage on the carriage track; and

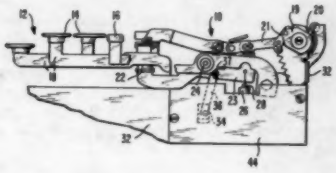
control means for controlling the print head and the carriage drive means to print selected alphanumeric information on the slide mount positioned at the printing station.

4,415,283
SHORTHAND MACHINE HAVING ACTIVE TACTILE FEEDBACK

Michael A. Smith, Slidell, La., assignor to Baron Data Systems, San Leandro, Calif.

Filed Jul. 27, 1982, Ser. No. 402,401
Int. Cl.³ B41J *3/26*
U.S. Cl. 400—94 **9 Claims**

1. A shorthand machine comprising a platen adapted for supporting paper; support means adapted for supporting an inked ribbon adjacent said platen; a plurality of print hammers; a plurality of keys, each key having a keystem mechanically coupling its associated key to an associated print hammer, each key normally assuming a rest position and movable to an actuated position to cause its associated print hammer to impact against an inked ribbon support by said support means to bring the linked ribbon into contact with paper supported on said platen to print a character on such paper; a universal bar extending beneath said plurality of keystems, said universal bar normally assuming a reset position adjacent said keystems when said keys are in their rest position and responsive to movement of said keys toward the actuated position to move to a second position; means to enable the machine operator to sense when the previously actuated keys are sufficiently returned toward the key rest position so that a succeeding key actuation will result in printing of characters properly posi-

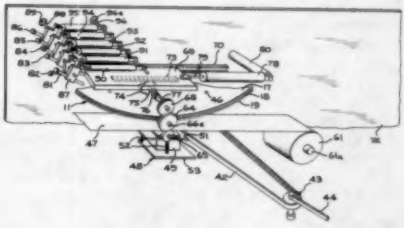


tioned relative to the characters printed in response to the previous key actuation, said means to enable including electrically actuated means responsive to initiation of the return of said keys from the actuated position to the key rest position for moving said universal bar toward said universal bar rest position, thereby urging said keys to return to said key rest position, termination of the actuation of said electrically actuated means resulting in a sensation indicating to the machine operator that another key stroke may be made; and means responsive to movement of said universal bar toward one of the second position and the universal bar rest position for rotating said platen to feed paper over said platen.

4,415,284
THERMAL DIE-CUTTING MACHINE FOR DIE-CUTTING LETTERS, NUMERALS AND OTHER CHARACTERS FROM PLASTIC TAPE

James N. Floyd, Lexington, Ky., assignor to James W. Moss, Louisville, Ky.

Filed Oct. 27, 1981, Ser. No. 315,289
Int. Cl.³ B41J *1/22*
U.S. Cl. 400—134 **16 Claims**



1. In an improved machine for heating and die cutting a printing tape with raised characters to form a reproduction of said characters in said tape, the improvements comprising

a frame,

a rotatable print plate disposed in said frame and defining a plurality of raised characters spaced in a circle on and around one broad surface thereof, said print plate comprising

a central hub,

a backing plate formed of a thermally conductive material attached to said hub,

means for effectively isolating said backing plate from said

hub thermally wherein said backing plate forms a heat reservoir, and

a thermally conductive printing ring attached to said backing plate, said raised characters being attached to said printing ring, said heating means being disposed between said printing ring and backing plate,

means attached to said print plate for heating said raised characters,

print pedestal means attached to said frame and disposed opposite said broad surface and containing a print pad movable upon command against any desired one of said raised characters depending upon the rotational alignment of said print plate relative to said pad,

means mounted in said frame for selectively advancing a printing tape across said pad by at least one predetermined distance between each successive heating and die cutting operation on said tape, and

locking means attached to said frame and engagable with said print plate upon command for locking and maintaining any desired one of said raised characters in precise alignment opposite said pad during each heating and die cutting operation on said tape.

16. In an improved machine for heating and die cutting a printing tape with raised characters to form a reproduction of said characters in said tape, the improvements comprising

a frame,

a rotatable print plate disposed in said frame and defining a plurality of raised characters spaced in a circle on and around one broad surface thereof,

means attached to said print plate for heating said raised characters,

print pedestal means attached to said frame and disposed opposite said broad surface and containing a print pad movable upon command against any desired one of said raised characters depending upon the rotational alignment of said print plate relative to said pad,

means mounted in said frame for selectively advancing a printing tape across said pad by at least one predetermined distance between each successive heating and die cutting operation on said tape, said advancing means comprising

a tape index plate movably attached to said frame,

gear train means responsively connected to said plate for rotational operation in response to the movement of said tape index plate in one direction,

tape roller means responsively connected to said gear train means for advancing said tape across said pad in response to the movement of said tape index plate in said one direction,

means for advancing and retracting said tape index plate relative to said frame upon command, and

stop means aligned in interferring relation with said tape index plate for limiting the advancement of said tape index plate to a precise distance, the distance of advance of said tape across said pad being proportional to said precise distance, and

locking means attached to said frame and engagable with said print plate upon command for locking and maintaining any desired one of said raised characters in precise alignment opposite said pad during each heating and die cutting operation on said tape.

4,415,285

UNIFILLED TAPE CASSETTE

John E. Bury, Eltham, England, assignor to Grafton Limited, London, England

Filed Apr. 26, 1982, Ser. No. 371,887

Claims priority, application United Kingdom, Jul. 23, 1981, 8122779; Jul. 30, 1981, 8123330

Int. Cl.³ B41J *32/02*

U.S. Cl. 400—196.1 **3 Claims**

1. A method of making a cassette filled with an inked ribbon, said method comprising the steps of:

providing a cassette body having means defining a ribbon space to be packed with an inked ribbon in serpentine manner, said body including means defining a ribbon inlet leading to said space, means defining a ribbon outlet leading from said space, and means for transporting ribbon through said cassette body;

threading a short length of noninked messenger ribbon between the said ribbon inlet and the said ribbon outlet along the intended ribbon path through said ribbon space and past said ribbon transport means with portions of said noninked messenger ribbon protruding outwardly from both the ribbon inlet and the ribbon outlet of the cassette body;

assembling a lid to the cassette body to form an assembled and sealed cassette with portions of said noninked messenger ribbon maintained protruding from both the ribbon inlet and the ribbon outlet;

attaching inked ribbon to the portion of said noninked messenger ribbon protruding from said ribbon inlet;

transporting ribbon through said cassette until the inked ribbon that was joined to the portion of noninked messenger ribbon protruding from the ribbon inlet has appeared at the ribbon outlet and the noninked messenger ribbon has been completely withdrawn from said cassette;

thereafter transporting the inked ribbon into the cassette until the ribbon space is filled with inked ribbon;

detaching said non-inked messanger ribbon from said inked ribbon; and

joining exposed portions of the inked ribbon now protruding from the ribbon inlet and the ribbon outlet of the cassette to form an endless loop of inked ribbon.

4,415,286

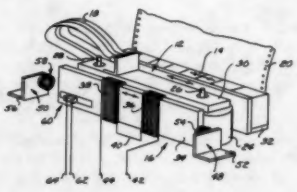
VARIABLE PRINT DENSITY ENCODER SYSTEM

Alan K. Jennings, Orange, Calif., assignor to Printronix, Inc., Irvine, Calif.

Filed Sep. 17, 1981, Ser. No. 303,081

Int. Cl.³ B41J *19/32*

U.S. Cl. 400—279 **8 Claims**



1. In a printer system in which a shuttle assembly having print elements mounted thereon undergoes generally linear motion along a path relative to a printable medium, an arrangement for providing variable density printing comprising means for generating a first succession of pulses as the shuttle assembly passes through a succession of different positions along the path, means for generating a second succession of pulses separated by selected time intervals, the second succession of pulses being applied to actuate selected ones of the print elements, means for storing values indicating the desired time intervals between selected ones of the first succession of pulses and selected ones of the second succession of pulses, means for measuring the actual time intervals between generation of selected ones of the first succession of pulses and generation of selected ones of the second succession of pulses, means for

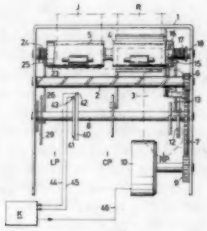
comparing the stored values with the measured actual time intervals to provide error signals and means for varying the occurrence of the second succession of pulses in accordance with the error signals.

4,415,287

PRINTING DEVICE FOR PRINTING CHARACTERS IN ROWS ON DATA CARRIERS

Tommy Wincent, Tiverton, R.I., assignor to Westrex Company, Asia, Fall River, Mass.

Filed Mar. 20, 1981, Ser. No. 245,812
Claims priority, application Sweden, Mar. 24, 1980, 80022494
Int. Cl.³ B41J *19/00*
U.S. Cl. 400—322 **1 Claim**



1. A printing device comprising print head means and a plurality of data carriers:

said print head means for printing data on at least one of said plurality of data carriers;

motor means for moving said print head means along said data carriers;

said print head means being adapted to rest at one of a plurality of home positions when said print head means is not in movement;

said motor means being reversible to change the direction of movement of said print head means;

switch means coupled to and controllable by said motor means;

said switch means being controlled by said motor means to assume a plurality of states, each of said states corresponding to the location of said print head means at a particular one of said plurality of print head home positions; and

printing control means for selecting which of said plurality of data carriers is to receive data printed thereon by said print head;

said printing control means being electrically coupled to said switch means and to said motor means;

said printing control means also acting in response to the state of said switch means to select the direction of movement of said motor means and, consequently, that of said print head means as well as the printing of data by said print head means; whereby,

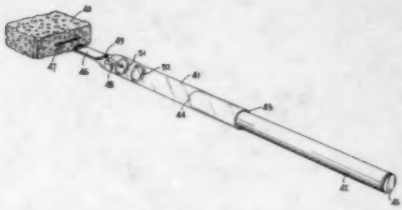
said print head means is moved from a previous home position to the particular one or more of said plurality of data carriers which are to receive data to be printed thereon by said print head means thereby bypassing any intervening data carriers on which data is not intended to be printed thereon during a given cycle of said printing device, said motor coming to rest under control of said printing control means at the conclusion of each cycle.

4,415,288

LIQUID DISPENSING DEVICE WITH CARTRIDGE-RUPTURING MEMBER

Marvin Gordon, East Windsor, and Joseph Lichtenstein, Colonia, both of N.J., assignors to Whitman Medical Corporation, Clark, N.J.

Continuation-in-part of Ser. No. 241,486, Mar. 9, 1981, abandoned. This application Aug. 31, 1981, Ser. No. 298,246
Int. Cl.³ A47L *13/17;* **A61M** *35/00*
U.S. Cl. 401—132 **3 Claims**



1. A liquid dispensing device comprising:

an elongated member having a hollow tubular handle portion and first and second ends, said first end being open to said tubular handle portion, said second end being configured as a paddle-like member formed integrally to said tubular handle portion and being transversely flexible relative to said tubular handle portion;

an absorbent sponge-like member disposed about said paddle-like member;

an elongated fluid-containing cartridge adapted for longitudinal slidability in said tubular handle portion of said elongated member, said cartridge having a rupturable forward end by which it is inserted into said open end of said elongated member;

flow passage means for providing flow communication from within said tubular handle portion to said sponge-like member along opposite sides of said paddle-like member; and

a cartridge-rupturing member positioned in said tubular handle portion proximate said second end and including a projection portion within said tubular handle portion to rupture said forward end of said cartridge in response to a predetermined slidable insertion of said cartridge into said tubular handle portion;

wherein said tubular handle portion includes a generally cylindrical interior surface along which said elongated cartridge is longitudinally slidable, said tubular handle portion further comprising an annular stop member projecting radially inward from said internal surface for resiliently engaging said forward end of said cartridge at a location wherein the cartridge is spaced from said projecting portion of said cartridge-rupturing member, the resilient engagement of said forward end by said annular stop member being overcome by force exerted longitudinally on said cartridge in the direction of said projecting portion to permit passage of said forward end of said cartridge into rupturable engagement with said projecting portion.

4,415,289

SELF-LOCKING NYLON POST

Joseph Barba, Jackson Heights, and Gerd L. Hochrain, Seaford, both of N.Y., assignors to Boorum & Pease Company, Brooklyn, N.Y.

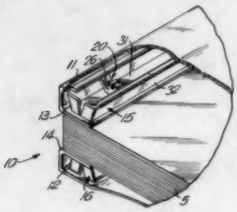
Filed Oct. 5, 1981, Ser. No. 308,671
Int. Cl.³ B42F *13/02*
U.S. Cl. 402—17 **6 Claims**

1. Fastening means for a loose leaf binder comprising:

(a) a binding element comprising a channel with a longitudinal axis having a floor with an opening therethrough, and side walls, the internal angle between the floor and the

side walls being obtuse, each side wall having an inwardly extending flange;

(b) a post having a head portion, an intermediate portion and an end portion, the head portion being larger than the opening in the floor of the binding element, the intermediate and end portions being able to pass through said opening; the head portion of the post having a relatively thin flexible tongue that extends outwardly a distance such that, when the post is mounted in the binding element by



inserting the intermediate and end portions through the opening and turned so that the tongue is oriented substantially perpendicular to the longitudinal axis of the channel, the tongue engages one of the side walls and flexes upwardly, the tongue having a width such that, when the post is mounted in the binding element and turned so that the tongue is oriented parallel the longitudinal axis of the channel, the tongue does not engage either of the side walls.

4,415,290

BINDER ASSEMBLY OF THE RING TYPE

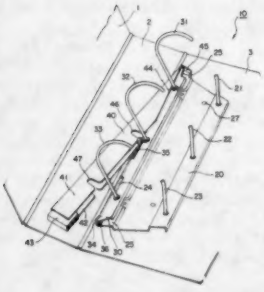
Kiyoshi Ohminato, Tokyo, Japan, assignor to King Jim Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1981, Ser. No. 336,305

Claims priority, application Japan, Jan. 27, 1981, 56-009231[U]

Int. Cl.³ B42F *13/12*

U.S. Cl. 402—26 **4 Claims**



1. A binder assembly of the ring type including a bottom plate, vertical rods fixed thereto, a pivot plate combined with said bottom plate by a spring, vertical pivot rods fixed to said pivot plate, a pivot arm mounted pivotally at one end thereof on said bottom plate and comprising an upper member and a lower member between which are clamped said bottom and pivot plates, said upper member being diagonally cut away at the pivot end of said arm to permit pivotal movement of said pivot plate when said arm is pivotted, and a stopper means formed at the pivot end of said arm by bending an extension of said lower member.

4,415,291

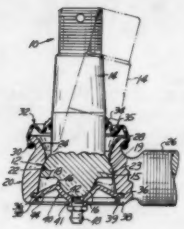
BALL AND SOCKET JOINTS

Joseph E. Smith, Birmingham, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Continuation-in-part of Ser. No. 61,644, Jul. 30, 1979, Pat. No. 4,347,014. This application Apr. 6, 1981, Ser. No. 251,254

Int. Cl.³ F16C *11/00*

U.S. Cl. 403—36 **35 Claims**



1. A ball and socket joint comprising a ball and a socket in mutual swivelling sliding engagement with each other, said ball having a stud integrally formed at an end thereof and projecting outwardly through one end of said socket, a peripheral spherical surface on said ball, said socket having a concave spherical bore surface engaged with a portion of the peripheral spherical surface of said ball proximate the stud, a substantially elliptical frusto-conical bore at said one end of said socket, a disk-shaped retainer member disposed at the other end of said socket, said disk-shaped retainer member having a partially spherical recess concentric to and engaged with a portion of said peripheral spherical surface of said ball farthest away from said stud, biasing means co-operating with said retainer member for urging said concentric spherical surfaces in mutual swivelling sliding engagement, and means holding both said biasing means and retainer member at said other end of said socket, said means comprising an annular step in said socket proximate said other end, said other end forming a rim beyond said annular step bent over for forming a lip holding the periphery of said disk-shaped retainer member against said annular step.

4,415,292

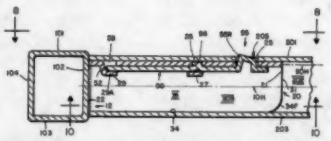
FRAME CONNECTOR STRUCTURE

Paul Alperson, 305 Heavenly Dr., Omaha, Nebr. 68154

Filed Oct. 11, 1979, Ser. No. 83,849

Int. Cl.³ B25G *3/00*; F16B *9/00*

U.S. Cl. 403—246 **5 Claims**



1. A hollow, unit handled, self locking connector structure adapted to be closely telescopically received within a hollow frame member having a registering-aperture to form a rigid joint therewith, said frame connector structure comprising:

A. a longitudinally extending rigid hollow body component that is substantially U-shaped in transverse cross-section and having two upright body-ends including a fore-end and a rear-end, said body including an apertured wall extending longitudinally between the body-ends and including an inner surface and an outer surface, said wall between the apertured portion thereof and body rear-end being at least once transversely struck therethrough

whereby the wall is provided with a transversely extending fore-slot and wall structural material is depressed below said fore-slot to provide a transversely extending underlying strap recessed inwardly the wall inner surface, transversely extending shelf means recessed inwardly the wall inner surface and located between the fore-slot and the body component rear-end, said apertured wall inner surface being in intervening relationship to transversely separated flanking-walls for said body and providing a regular transverse finite-width between the flanking-walls; and

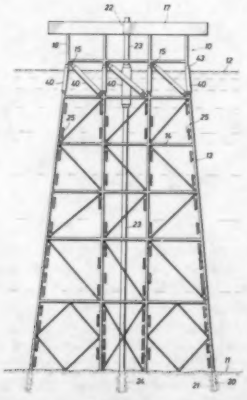
B. a substantially flat spring metal strip component longitudinally extending from forward-end to rearward-end thereof and having broad upper and lower surfaces, the spring forward portion immediately rearwardly its forward-end being provided with an upwardly extending locking projection surrounded by the body wall aperture, said spring forward portion being further provided with an upwardly extending shoulder located rearwardly said locking projection and in co-elevational registry with the wall fore-slot to prevent the spring from slidably moving longitudinally forwardly, the spring forward portion being transversely wider than the spring rearward portion and abutting the said body transverse strap, the transverse-width of the spring forward portion exceeding nine-tenths the finite-width of the apertured wall inner surface, and said spring rearward-end being supported atop said shelf means and said spring being surrounded by said body inwardly recessed strap whereby the spring is mounted inside the body component in cantilever fashion so as to normally maintain the locking projection elevated above the apertured wall outer surface and for receiving the registering-aperture of the hollow frame member to be removably connected.

4,415,293

OFFSHORE PLATFORM FREE OF MARINE GROWTH AND METHOD OF REDUCING PLATFORM LOADING AND OVERTURN

Robert F. Engel, Kingwood; Thomas E. Long, Houston, and Ralph M. Warrington, Humble, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 5, 1982, Ser. No. 365,223
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—216 **12 Claims**



1. An offshore platform having a multileg steel structure adapted to extend from a point above the surface of a body of water to a substantial distance therebelow, said platform substructure comprising

a plurality of upwardly-extending tubular members in the form of legs to support a platform deck thereon, each of said tubular members traversing the surface of a body of water,

a plurality of additional tubular members in the form of bracing and well conductors connected to said platform,

a sheath element concentrically mounted to surround each of a selected number of the tubular members of said substructure, each sheath element being in concentric spaced relation therewith extending from a point about adjacent the surface of the water downwardly for a distance sufficient to cover the area subject to the accumulation of at least the major portion of fouling marine growth,

said sheath element including a substance for generating in sea water a source of marine growth-inhibiting agent in an amount sufficient, when positioned in sea water, to eliminate substantially the growth and attachment of marine growth on a tubular member covered with said sheath element, and

insulating connector means fixedly securing said sheath element to said tubular member for substantially electrically insulating said sheath element from said tubular member.

4,415,294

SUPPORT MEANS AND SYSTEM FOR SUPPORTING MINE ROOFS

Thomas Ringe, P.O. Box 303, Phoenixville, Pa. 19460

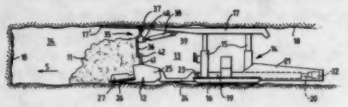
Filed Aug. 20, 1981, Ser. No. 294,735
Int. Cl.³ E21D *21/00*
U.S. Cl. 405—259 **10 Claims**

1. A mine roof bolt adapted for insertion in a vertical hole in a said roof, said bolt comprising a U-shaped body member with laterally spaced front edges, said front edges having a stepped curvilinear configuration defining first cam surfaces, a slide member coactive with said body member and having a similar mateable stepped curvilinear configuration defining second cam surfaces, said members being coactive upon relative opposite rectilinear displacement of said mating stepped cam surfaces from low to high portion contact thereof to laterally space said members and create lateral oppositely directed forces against contacted side portions of the hole, and protrusion means on said slide member extending into, and coacting with the interior of said U-shaped body member to prevent substantial lateral movement therebetween and maintain said cam surfaces in confronting contacting engagement.

4,415,295
MINERAL MINING INSTALLATIONS

Georg Werner, and Paul Wisniewski, both of Lunen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lunen, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 331,997
Claims priority, application South Africa, Dec. 30, 1980, 80/8106
Int. Cl.³ E21D 23/00
U.S. Cl. 405—291 12 Claims

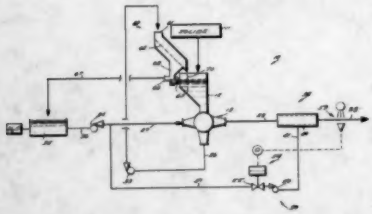


1. In a mineral mining installation suitable for winning material by explosive blasting; said installation comprising a conveyor extending alongside a mineral face, roof supports disposed alongside the conveyor remote from the mineral face, said roof supports having roof-engageable structures supported by hydraulic props, hydraulic shifting rams operably connected between the conveyor and the supports and means for selectively screening off the winning and conveying region of the working from the access region; the improvement comprising the screening means includes wall components pivotably connected to the roof-engageable structures of the supports and capable of adopting an operating position depending from the roof-engageable structures or an inoperative stowed position and the conveyor has further wall components forming part of the screening means and acting as an abutment against which the wall components engage when set in their operating position.

4,415,296
MATERIALS TRANSFER SYSTEM AND METHODOLOGY

Erwin D. Funk, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Sep. 14, 1981, Ser. No. 302,081
Int. Cl.³ B65G 53/66
U.S. Cl. 406—19 25 Claims



1. A method of continuously conveying hard particulate material of non-uniform size, such as coal, utilizing a high pressure device including a pocketed rotor containing a pair of diametrically through-going pockets perpendicular to each other, a housing enclosing the rotor and having four ports equally spaced around the periphery thereof for registry with inlets and outlets to and from the through-going pockets in the rotor, at least one screen associated with the housing and rotor for allowing passage of liquid and fine particles therethrough, but preventing passage of particles larger than a predetermined size therethrough, and high and low pressure feed lines and discharge lines leading to and from the rotor ports; the method comprising the steps of

(a) continuously feeding liquid, containing the hard particulate material, under low pressure in a low pressure feed line into a first of the housing ports for entry into a through-going pocket of the rotor;

(b) rotating the rotor in a given direction of rotation, so that the pocket openings therein progressively rotate past each of the housing ports;

(c) providing low pressure withdrawal of liquid introduced through the first port from through-going pockets of the rotor through a third port of the housing into a low pressure discharge line, opposite the first port, and screening the particulate material above a predetermined size out of the liquid passing through the third port with the at least one screen;

(d) pumping liquid under high pressure in a high pressure feed line toward the rotor through a fourth port of the housing, the fourth port being located before the first port in the direction of rotation of the rotor, and between the first and third ports;

(e) providing withdrawal of liquid and material through a second port, located opposite the fourth port, into a high pressure discharge line;

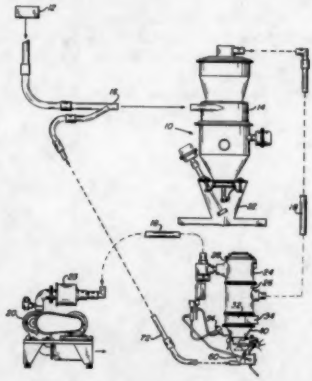
(f) withdrawing a portion of the liquid, while under high pressure, from the high pressure discharge line to increase the solids concentration in the high pressure discharge line; and

(g) returning liquid withdrawn in step (f) to the high pressure feed line, boosting the pressure thereof so that it corresponds generally to the pressure of the liquid in the high pressure feed line.

4,415,297
VACUUM MATERIAL TRANSPORTING SYSTEM

Douglas J. Boring, Franklin, Pa., assignor to Conair, Inc., Franklin, Pa.

Filed May 14, 1979, Ser. No. 38,391
Int. Cl.³ B65G 53/60
U.S. Cl. 406—168 7 Claims



1. In a particulate material conveying system wherein particulate material is conveyed from a source of such particulate material for spaced periods of time with respect to selected particulate receiving means of a plurality of particulate receiving means by entraining the particulate material in an airstream created by a selectively actuatable vacuum pump connected to the downstream end of a vacuum line cooperable with such a source and each of said particulate receiving means and during which periods lightweight fines of the particulate material flow through the vacuum line, the improvement comprising: continuously removing, during each period said particulate material is being conveyed, such lightweight fines from the section of said vacuum line extending between said vacuum pump and of the one of said particulate receiving means closest to said vacuum pump in terms of said particulate material flow

while simultaneously accumulating the removed lightweight fines at a first location subject to the vacuum in said vacuum line; discontinuing the vacuum in said vacuum line at the end of each period particulate material is being conveyed; discharging said accumulated light-weight fines from said first location to a second location in material flow communication with said first location only during periods said vacuum in said vacuum line is discontinued and retaining such discharged lightweight fines at said second location, and subsequently recirculating said lightweight fines retained at said second location to said vacuum line when a vacuum exists therein.

4,415,298

FREIGHT LASHING AND LOCKING MECHANISM

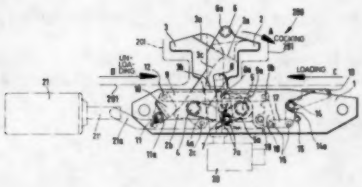
Werner Voigt, Weilheim, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 125,184, Feb. 27, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,329

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027160

Int. Cl.³ B60P 7/08; B64D 9/00

U.S. Cl. 410—69 **5 Claims**



1. A freight lashing and locking mechanism, especially for a loading space in an aircraft, comprising two outer frame side walls arranged in parallel to each other and defining a space of given width between said side walls, an inner bracing member (**1**″) extending in parallel to and between said two outer frame side walls for dividing said space into a larger space along one side wall and into a smaller space along the other side wall, crosswise extending means operatively interconnecting said side walls and bracing member to form a frame, operating components including first and second freight lashing claws (**2, 3**) and respective first and second journal means (**4, 5**) in said frame tiltably supporting the respective lashing claws (**2, 3**) in said larger space for tilting substantially in unison in one or the opposite direction, each of said freight locking members having a respective slanting wedging surface (**2***a*, **3***a*) for cooperation with each other to lock the lashing claws (**2, 3**) into an upright freight lashing position, first and second torque springs (**4***a*, **5a**) operatively installed in said frame for holding the respective freight lashing claw in the freight lashing position, a foot lever (**6**) and cam means (**6***a*) operatively secured to one of said lashing claws which cooperate for cocking the lashing claws (**2, 3**) in unison into a recessed position in said larger space prior to a loading operation, cocking release means (**8**) journalled (at **7**) in said frame, first connecting means (**8***a*, **9**, **9***a*, **9***b*, **10, 12**) operatively connecting said cocking release means (**8**) to said first freight lashing claw (at **2***b*), said release means (**8**) extending in a working position above a top edge of an adjacent one of said frame side walls for actuation by a freight item and below the top edge of said adjacent frame side wall in a standby position, a foot pedal (**13**) journalled (at **14**) and biased (at **14***a*) in said frame, second connecting means (**16, 17, 18, 19**) operatively connecting said foot pedal (**13**) to the first connecting means (at **9***b*) for returning said release means (**8**) from said standby position into said working position, said foot lever (**6**), said release means (**8**), said foot pedal (**13**) and said first and second, connecting means being operatively mounted in said smaller space substantially alongside said first and second lashing claws (**2, 3**) for easy access by an operator, whereby all of said operating components are operable manually, semiautomatically and automatically without any structural changes.

4,415,299

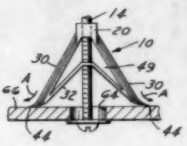
ANCHORING RETAINER FOR THREADED FASTENERS

Jon D. Smith, Fenton, and Glenn T. Parker, Ortonville, both of Mich., assignors to Dry Dock Industries, Inc., Fenton, Mich.

Continuation of Ser. No. 929,689, Jul. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 803,806, Jun. 6, 1977, Pat. No. 4,143,581. This application Jul. 17, 1980, Ser. No. 169,576

Int. Cl.³ F16B 13/04

U.S. Cl. 411—340 **8 Claims**

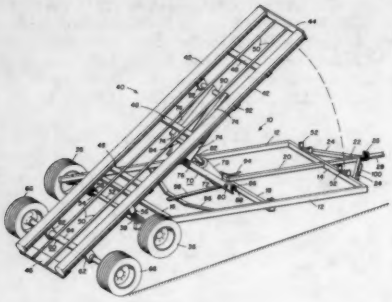


1. A retainer for mounting at one side of a supporting structure having an opening therein, said retainer being bendable and inserted from the other side of the supporting structure through said opening and thereafter returning to its initial shape due to its design and the resiliency of the material thus to engage the one side of the supporting structure, said retainer being adapted to be used with a threaded element which extends from the other side of the supporting structure through the opening into the retainer, said retainer comprising a flexible unitary one-piece body made from a plastic material, said body having an axis which is adapted to extend through the opening in the supporting structure, said body being of generally triangular configuration and having at the apex thereof a sleeve provided with a sleeve opening surrounding said axis, said sleeve being of rectangular cross section and having two pairs of opposing edges, said sleeve at one pair of opposing edges being provided with a pair of integrally formed outwardly diverging elongated flexible legs, the outer ends of said legs being adapted to engage the one side of the supporting structure, each of said legs having a width generally equal to the distance between the other pair of opposing edges of said sleeve, and an elongated flexible control strut spaced axially from said sleeve and located entirely between said legs, said strut having the ends thereof integrally connected to the outer ends of said outwardly diverging elongated flexible legs for limiting the spread of said legs, said control strut being of V-shape and including a central strut portion located axially beneath and spaced from said sleeve and a pair of outwardly diverging strut portions, each of said outwardly diverging strut portions being integrally connected to said central strut portion and to one of the flexible legs near the outer end thereof, said central strut portion having a central aperture axially aligned with and spaced from said sleeve opening and through which the threaded element is adapted to extend, said control strut being adapted to be moved away from said sleeve and towards the one side of the supporting structure and to be placed in tension thereby bending said outwardly diverging flexible legs and placing same in compression upon the threading of the threaded element into the opening in said sleeve, the outer ends of said legs being provided with relatively thin flexible tips which are adapted to engage the one side of the supporting structure for frictional contact and to direct easy movement of the legs.

4,415,300
TRANSPORTER-UNLOADER FOR LARGE CYLINDRICAL HAY BALES

Mark J. Boddicker, R.R. #2, Box 124, Walker, Iowa 52352

Filed Sep. 22, 1981, Ser. No. 304,343
Int. Cl.³ A01D *87/12;* **B60P** *1/18*
U.S. Cl. 414—24.5 **5 Claims**



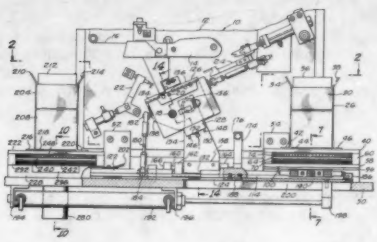
1. A transporter-unloader for large, generally cylindrical hay bales of the kind described comprising: a longitudinally extending and rigid main frame having front and rear ends, the front end being adapted for connection to tractor means; a longitudinally extending load frame for carrying said bales having front and rear ends, a forward portion of the load frame longitudially overlying and supported by the main frame, an after portion of the load frame extending aft of the rear end of the main frame, the load frame being pivotally connected to the main frame about an axis transverse with respect to both frames, said axis being disposed adjacent the rear end of the main frame and between said forward and after portions of the load frame effective so that the load frame may be raised from a bale transport position to selected inclined bale unloading positions relative to the main frame; means to raise the load frame to and maintain the same in said unloading positions; a first pairs of wheels disposed laterally outboard of the load frame and adjacent and supporting the rear end of the load frame off the ground when the load frame is in its unloading position; and a second pair of wheels disposed laterally outboard of the main and load frames and adjacent the rear end of the main frame, one pair of said wheels being disposed off the ground when the transporter-unloader is unloaded and in its bale transport position, the other pair of said wheels engaging the ground when the transporter-unloader is loaded or unloaded and in its bale transport position, the load frame being adapted to receive and position the hay bales sequentially therealong with their axes disposed generally lengthwise of the load frame and to permit the hay bales to slide sequentially off the rear end of the load frame onto the ground when in its bale unloading position as the transporter-unloader is moved forwardly.

4,415,301
CASSETTE HANDLING DEVICE

Darrell W. Zielke, Valencia, Calif., assignor to West American Sound, Inc., North Hollywood, Calif.

Filed May 19, 1980, Ser. No. 151,326
Int. Cl.³ B65G *57/30, 60/00*
U.S. Cl. 414—31 **20 Claims**

18. A cassette handling device comprising
a station for receiving individual cassettes in a first horizontal orientation;
a magazine positioned above said station and designed and constructed to retain a stack of cassettes in horizontal orientations rotated from said first orientation;
a stationary gate between said station and said magazine for passage of cassettes therethrough, said stationary gate being aligned with said station; and
a pivotally mounted gate positioned between said magazine

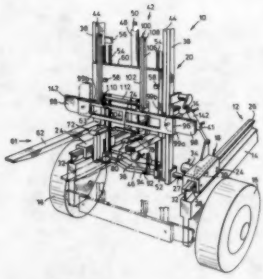


and said stationary gate for passage of cassettes therethrough, said pivotally mounted gate being selectively alignable with said stationary gate and with the cassettes in said magazine.

4,415,302
PALLET RETRIEVING MECHANISM FOR FORKLIFT VEHICLE

Gerardus J. Brouwer, Keswick, and William T. Arnold, Sutton West, both of Canada, assignors to Brouwer Turf Equipment Limited, Toronto, Canada

Filed Aug. 27, 1981, Ser. No. 296,921
Int. Cl.³ B66F *9/10, 9/19*
U.S. Cl. 414—417 **4 Claims**



1. A vehicle comprising:
(a) a pair of forks facing in a predetermined direction for supporting a pallet,
(b) a frame,
(c) a fork carriage,
(d) means mounting said fork carriage on said frame for movement back and forth in said direction between an extended outer position and a retracted inner position,
(e) means mounting said forks in said fork carriage and for raising and lowering said forks,
(f) stop means mounted on said frame in a position such that when said forks are in said extended position a pallet supported thereon is located outwardly of said stop means and such that said forks may be withdrawn inwardly of said stop means,
(g) a gate;
(h) and means for supporting said gate outwardly of said stop means and extending across said forks, so that when said gate is located between the contents of a pallet on said forks and said stop means and then said fork carriage is withdrawn inwardly, movement of said gate inwardly will be prevented by said stop means and said gate will act to discharge the contents of said pallet onto the ground,

(i) said means (h) comprising:

(i) link means pivotally connected to said forks and to said gate and extensible between a first folded position in which said gate is supported by said link means over the rear of said forks and a second extended position in which said gate is supported by said link means over the fronts of said forks,

(ii) and means biasing said link means to said first position,

(j) said link means comprising: two pairs of links, each said pair having a first link pivotally connected to said forks and a second link pivotally connected to said gate, said first and second links each extending substantially vertically when said link means is in said first position, the upper ends of said first and second links being pivotally connected together,

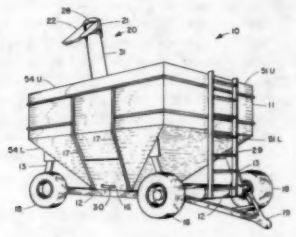
(k) said vehicle including a cross shaft connected between said forks at the rear thereof, said first links being fixed to said cross shaft, said biasing means including spring means within said cross shaft.

4,415,303

AUGER WAGON

Neal W. Westendorf, and Joseph W. Langenfeld, both of Onawa, Iowa, assignors to Westendorf Manufacturing Company, Onawa, Iowa

Filed May 14, 1981, Ser. No. 263,403
Int. Cl.³ B60P *1/40*
U.S. Cl. 414—519 **9 Claims**



1. An auger wagon comprising:

a wheel mounted frame,

a container box operably mounted on said frame wherein said container box comprises an open top, inwardly sloping lateral walls, and a box floor attached at its periphery to said lateral walls, and

a single auger means mounted on the floor of said container box for transporting particulate matter,

said auger means comprising an auger housing and an auger screw operably mounted within said auger housing,

said auger means comprising a top end and a bottom end and wherein said bottom end of said auger means is pivotally connected to said box floor, the distance between the top and bottom of said auger means being greater than the distance between said point of pivotal attachment and any point on the walls of said box,

said auger floor comprising an auger well positioned at the point of auger means attachment adapted to allow inclination of said auger means against the walls of said box,

said auger means comprising an auger head, for directing the outflow of particulate material, pivotally mounted at the top of said auger means wherein the pivot axis of said auger head is coaxial with the longitudinal axis of said auger screw,

said auger means comprising an auger housing openings positioned in said housing near the bottom of said auger means for allowing the inflow of particulate matter into said auger means, said auger means comprising an auger cover positioned at the bottom of said auger means in enclosing relationship with said housing openings for selectively covering and uncovering said housing openings,

said auger means comprising a first motor means operably attached to said auger screw for turning said auger screw,

said auger means comprising a second motor means operably attached to said auger head for selectively rotating said auger head,

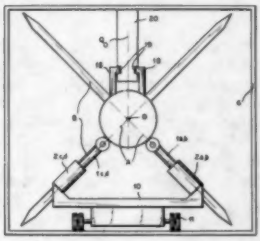
said auger means comprising an elongate cover handle operably attached to said auger cover and mounted on the bottom exterior surface of said box floor for selectively rotating said auger cover with respect to said housing openings.

4,415,304

SYSTEM FOR FLOATINGLY SUPPORTING A LOAD

Antonino Tripoli; Bruno Baldi, and Bruno Piacentini, all of Rome, Italy, assignors to Seienia, Industrie Elettroniche Associate, S.p.A., Rome, Italy

Filed Jan. 25, 1982, Ser. No. 342,392
Claims priority, application Italy, Jan. 26, 1981, 47638 A/81
Int. Cl.³ B66F *5/00*
U.S. Cl. 414—589 **5 Claims**



1. A system for floatingly supporting an elongate load in a recumbent position to enable manual alignment thereof with a predetermined horizontal reference line, comprising a first and a second pair of hydraulic jacks disposed in respective vertical planes perpendicular to said reference line, the jacks of each pair lying below the level of said reference line on opposite sides of another vertical plane including said reference line and having inclined axes intersecting in the vicinity of said reference line, each of said jacks being provided with a single-acting piston movable along the axis thereof for engagement with a load whose center of gravity lies substantially midway between respective vertical planes, said jacks being connected to a source of hydraulic fluid under a pressure substantially balancing the weight component of the engaged load acting upon the respective piston.

4,415,305

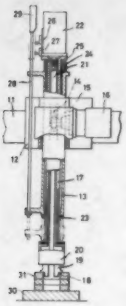
HANDLING APPARATUS

Mitsuro Tsubuku, and Tadanobu Yoshihiro, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 103,840, Dec. 12, 1979, abandoned. This application Mar. 3, 1982, Ser. No. 354,270
Claims priority, application Japan, Dec. 12, 1978, 53-154365; Fed. Rep. of Germany, Dec. 11, 1979, 2949745
Int. Cl.³ B65G *57/03*
U.S. Cl. 414—753 **4 Claims**

1. A handling apparatus, comprising: a guide rail (**11**), a frame (**12**) laterally movable along said guide rail, a hollow cylindrical arm (**13**) movable in a vertical direction, an operating rod (**21**) passing through said hollow cylindrical arm, an inner cylinder (**17**) positioned within said cylindrical arm and around said operating rod, a spring (**23**) disposed between ends of said inner cylinder and said cylindrical arm for biasing said inner cylinder downwardly, stop means for said spring, clamp-

ing means (20) coupled to a lower end of said inner cylinder for clamping a top one of stacked workpieces (31), a controller (22) having a frame coupled to an upper end of said inner cylinder and being operationally coupled to said operating rod for operating said clamping means, a contact portion of said clamping means for contacting and sensing the uppermost surface of the workpiece whereby when the contact portion



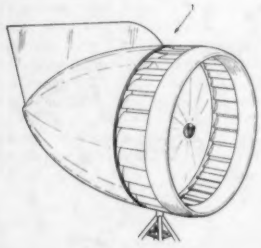
abuts against the uppermost surface of the workpiece only said cylinderical arm may be further lowered, switch means (26, 27) mechanically coupled to said controller for controlling movements of said cylindrical arm, and dog means (29) coupled at one end portion to said cylindrical arm and having a second end portion positioned adjacent said switch means for operating said switch means in accordance with the relative vertical positions of said cylindrical arm and said inner cylinder.

4,415,306

TURBINE

Kenneth J. Cobden, Flat 1, 369 Deakin Ave., Mildura, Victoria 3500, Australia

Filed Apr. 20, 1982, Ser. No. 370,283
Int. Cl.³ F03D 1/04
U.S. Cl. 415—2 A **14 Claims**



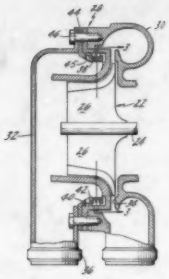
1. A fluid turbine unit to deliver power extracted from a moving fluid, the turbine having a turbine wheel mounted for rotation about an axis parallel to the fluid flow, a plurality of cantilever vanes mounted on said turbine wheel and extending to forward vane ends, an inlet fairing mounted for rotation adjacent the forward vane ends of said vanes, said inlet fairing having a cross-section which provides an aero-foil section such that fluid flowing over the outside of the inlet fairing is accelerated relative to the fluid flowing into the turbine, said vanes being situated in a passage through the aero-foil section at a position corresponding generally to the center of lift of the aero-foil section whereby the fluid flows through the passage to the lower pressure area of the aero-foil section to act on the turbine vanes.

4,415,307

TEMPERATURE REGULATION OF AIR CYCLE REFRIGERATION SYSTEMS

William E. Fortmann, West Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 9, 1980, Ser. No. 157,774
Int. Cl.³ F01D 17/00
U.S. Cl. 415—12 **3 Claims**



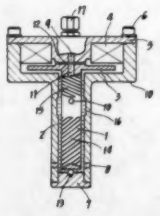
1. A turbine for an air cycle refrigeration system said turbine comprising a rotor provided with a plurality of blades and a stator, said stator receiving air through an inlet thereof, said air being expanded and cooled in said turbine and delivered from said turbine through an outlet thereof, said turbine being characterized by said stator having a plurality of bypass ports therewithin, said bypass ports communicating with said inlet and outlet and accommodating airflow from said inlet to said outlet, bypassing said rotor, said stator further including therewithin an annular, bimetallic valve element disposed adjacent said bypass ports in selective sealing relation thereto, said bimetallic valve member being responsive to the temperature of airflow through said turbine by variations in the diameter of said valve member for adjusting the effective area of said bypass ports thereby adjusting the amount of airflow therethrough, and selectively varying the amount of heat removed from said air by said turbine.

4,415,308

PUMP FOR SUPPLYING KEROSENE TO COMBUSTION APPARATUS

Teruo Maruyama, Neyagawa; Hiroo Ohshima, Nara; Fumio Iwai, and Yoshikazu Abe, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 9, 1981, Ser. No. 252,595
Claims priority, application Japan, Apr. 15, 1980, 55-49708
Int. Cl.³ F01D 5/00, 11/00
U.S. Cl. 415—72 **8 Claims**



1. A pump for supplying kerosene to a combustion apparatus comprising:

housing means provided therein with a passage and having an inlet and outlet,

rotor means entirely accomodated within said housing means and including a shaft disposed in said passage of said housing means, said shaft and said passage having radially opposed surfaces,

stator means carried by said housing means for electromagnetically rotating said rotor means relative to said housing means,

pumping groove means formed in one of said radially opposed surfaces of said shaft and said passage for forcing the kerosene along said groove means by the rotation of said shaft and for forming a fluid bearing between the shaft surface and the passage surface by the kerosene, said pumping groove means comprising a helical groove formed in said surface of said shaft on a first axial portion of said shaft at one end thereof, said rotor means is provided at the other end of said shaft, and a sealing helical groove is formed on a second axial portion of said shaft adjacent to said rotor means, said sealing helical groove being inclined in a direction opposite to the inclination of said pumping helical groove,

an axial channel provided in said shaft and communicating with said outlet of said housing means, and

a port provided in said shaft intermediate said first and second axial portions thereof and extending between said channel and said surface of said shaft, said port being adapted to conduct kerosene from said pumping groove means to said axial channel,

wherein said pumping groove means has a groove depth ho defined by

$$0.00558q\mu < ho < 250\mu$$

where q is the heat output of the combustion apparatus in kcal/h.

4,415,309

GAS TURBINE ENGINE SEAL

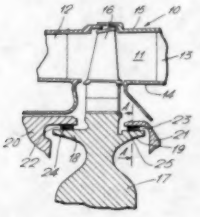
Leslie G. Atterbury, Herts, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 12, 1981, Ser. No. 235,158

Claims priority, application United Kingdom, Mar. 1, 1980, 8007039

Int. Cl.³ F04D *29/08*; F02F *11/00*

U.S. Cl. 415—170 R **8 Claims**



1. A gas turbine engine provided with a seal for providing a gas seal between first and second relatively rotatable annular gas turbine engine components, said seal comprising an annular element attached to the first of said components and consisting of a woven fabric having metallic warp filaments, metallic weft filaments and metallic warp pile filaments, said warp pile filaments having free ends extending from one surface of said woven fabric and which are non-looped and looped ends forming part of another surface of said woven fabric, and means directly attaching said another surface of said woven fabric of said annular seal element including said warp filaments, said weft filaments and said looped ends of said warp pile filaments directly to said first engine component so that the non-looped free ends of said metallic warp pile filaments extending from the one surface of said woven fabric abut said second engine component in sealing engagement, said means including forming at least some of said metallic filaments from a brazing alloy to permit the at least some of said filaments formed of the brazing alloy to be directly brazed to said first engine component thereby preventing capillary flow of the brazing alloy into the warp pile filaments.

4,415,310

SYSTEM FOR COOLING A GAS TURBINE BY BLEEDING AIR FROM THE COMPRESSOR

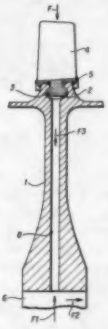
Jean G. Bouiller, Bruney; Francois E. G. Crozet, Yerres, and Marcel R. Soligny, Chevilly-Larue, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Oct. 6, 1981, Ser. No. 309,210

Claims priority, application France, Oct. 8, 1980, 80 21454

Int. Cl.³ F01D *5/08*

U.S. Cl. 416—95 **5 Claims**



1. A system of bleeding air from a compressor for cooling a gas turbine element having at least one compressor blade bearing disc, said system comprising:

at least one radial duct in each said disc, each said duct extending in the plane of a respective at least one said disc to the radially outer periphery thereof;

platforms associated with said compressor blades and covering at least a portion of the radially outer periphery of each said disc; and

ports formed in said platforms for each said at least one radial duct, wherein said ports are elliptical in cross section, the large axis of each said elliptical shape being perpendicular to the overall flow of fluid in said turbine, whereby air is channeled through said ports and said radial ducts into the center of said gas turbine towards said turbine element.

4,415,311

VERTICAL SHAFT WINDMILL

David C. Grana, Hampton, and Spencer V. Inge, Jr., Poquoson, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 28, 1982, Ser. No. 383,063

Int. Cl.³ F03D *7/06*

U.S. Cl. 416—117 **3 Claims**

1. An improved windmill design comprising:

a vertical shaft mounted for rotation;

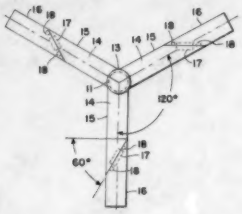
several straight elongated horizontal flat surface blades attached to said vertical shaft and radiating therefrom with the centerline of each blade from end to end is on a straight line that passes through the center of said shaft;

each of said blades separated into an inboard section attached to said vertical shaft with its flat surface up and an outboard section said inboard section and outboard sec-

tion separated along a straight line making an angle of greater than zero and less than 90° with a line perpendicular to the centerline of said blade;

hinge means for hinging said outboard section to said inboard section along said straight line making an angle greater than zero and less than 90° with a perpendicular to the centerline of said blade; and

said hinge means including means for restricting the motion of said hinge means between a position where the combined outboard section and inboard section form a flat surface and the position where the outboard section surface is at a 90° angle with the inboard section surface when the weight of said outboard section hinges it downward;



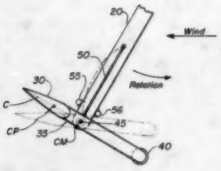
whereby whenever said windmill is at rest all of said outboard sections will be perpendicular to said inboard sections and then when the wind begins to blow at least one of said outboard sections will be forced against its corresponding inboard sections creating a torque on said shaft causing it to rotate and whenever the velocity of the wind increases to a certain level the centrifugal force will cause all inboard sections to be hinged to their flat positions resulting in no increased torque on the shaft with further increases in wind velocity.

4,415,312

TRANSVERSE AXIS FLUID TURBINE

Ben Brenneman, Lynchburg, Va., assignor to Wixlin, Inc., Lynchburg, Va.

Filed Mar. 11, 1982, Ser. No. 356,944
Int. Cl.³ F03D 7/06
U.S. Cl. 416—119 **12 Claims**



1. A fluid turbine having a predetermined maximum permissible rotational speed comprising

a rotation axis transverse to the direction of fluid flow,

at least two blade assemblies spaced from and mounted for balanced rotation about the rotation axis,

each blade assembly including an elongated blade having a streamlined cross-section and a span parallel to the rotation axis,

each blade assembly being pivotable about a pivot axis which is parallel to and spaced from the rotation axis,

each blade assembly being so constructed and positioned that the chord of its blade lies along a line which intersects the assembly's pivot axis and is perpendicular to a radius from the rotation axis to the pivot axis when the assembly is undistrubed,

the pivot axis of each blade assembly being located circumferentially ahead of the center of pressure of the blade with respect to the direction of turbine rotation, and

each blade assembly being so constructed that its center of mass is located at its pivot axis,

characterized in that

each blade assembly includes elastic means which tend to return the assembly to its undisturbed position whenever fluid or inertial forces cause it to pivot away from such position,

the elastic means having stiffness characteristics such that reverse flow of fluid over the blade creates a predetermined minimum fluid velocity at which turbine rotation is to begin,

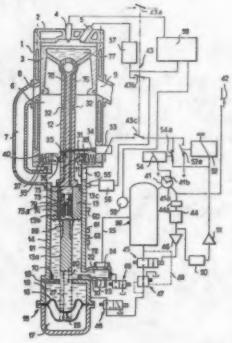
the blade assembly having a predetermind mass moment of inertia which in combination with said stiffness characteristics of said elastic means imparts to said blade assembly a natural frequency about its pivot axis in cycles per second equal to said predetermined maximum permissible rotational speed of the turbine in revolutions per second.

4,415,313

HYDRAULIC GENERATOR WITH FREE-PISTON ENGINE

Pierre Louthors, Croissy sur Seine, and Olivier Breting, Cormeilles en Parisis, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Aug. 5, 1981, Ser. No. 290,319
Claims priority, application France, Aug. 5, 1980, 80 17288
Int. Cl.³ F04B 17/00
U.S. Cl. 417—38 **17 Claims**



1. A hydraulic pressure generator comprising:

an internal combustion engine having a cylinder and a free piston;

a hydraulic pump housing;

at least one hydraulic fluid pumping piston in said hydraulic pump housing and movable with said free piston, each said pumping piston having a reduced diameter portion;

hydraulic fluid in a pumping chamber of said housing defined by said pumping piston for being pumped by movement of said pumping piston;

a hydropneumatic return cushion in fluid communication with said chamber of said housing via an aperture, wherein said reduced diameter portion of said pumping piston closes said aperture during the stroke of said free piston;

means for locking said free piston in a bottom dead center position;

control means for controlling said means for locking;

a hydraulic accumulator in fluid communication with said fluid in said chamber of said housing;

sensor means for detecting the fluid pressure in said accumulator; and

manual means for actuating said means for locking,

wherein said control means is operative to actuate said means for locking when said sensor means detect a first high pressure, and operative to deactuate said means for locking when said sensor means detect a second low pressure.

4,415,314

METERING PUMP

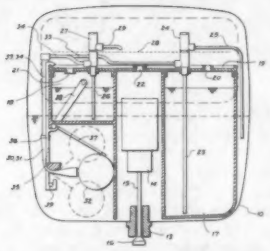
Anthony G. Chappell, Mosman, Australia, assignor to Wellcome Australia Limited, Sydney, Australia

Continuation of Ser. No. 144,320, Apr. 28, 1980. This application Jul. 12, 1982, Ser. No. 397,203

Claims priority, application Australia, May 4, 1979, PD8634

Int. Cl.[3] **F04F** *1/02;* **F04B** *35/02, 43/08;* **E03D** *9/02*

U.S. Cl. 417—131 **5 Claims**



1. A pump positioned in a first liquid reservoir operable by the rise and fall of liquid within the reservoir, said pump comprising a pump chamber having intake and discharge ports and normally closed intake and discharge valves in said ports, a tube formed of resiliently deformable material, said tube having a closed first end and an open second end, said open second end being in communication with the pump chamber, a float device coupled to the tube adjacent the first closed end, the float device, together with the closed first end of the tube, being movable upwardly and downwardly with the rise and fall of liquid within the reservoir, means defining an abutment surface which is engageable by a wall portion of the tube intermediate the first and second ends of the tube, the abutment surface being disposed such that the tube is caused, by engagement with the abutment surface with movement of the liquid in one direction within the reservoir, to be constricted and is caused to expand with movement of the liquid in a direction away from the abutment surface to thus alternately increase the pressure in the pump chamber and decrease the pressure in the pump chamber to thus alternately simultaneously open the intake valve and close the discharge valve and simultaneously close the intake valve and open the discharge valve.

4,415,315

SWASH-PLATE TYPE COMPRESSOR HAVING AN IMPROVED LUBRICANT OIL FEEDING ARRANGEMENT

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 315,229

Claims priority, application Japan, Nov. 6, 1980, 55-156903

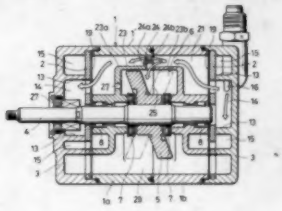
Int. Cl.[3] **F04B** *1/16, 1/18*

U.S. Cl. 417—269 **9 Claims**

1. In a swash-plate type compressor of the type having a pair of cylindrical members joined together in axial alignment and forming a cylinder block; a pair of cylinder heads secured to opposite ends of said cylinder block, said cylinder heads having first and second low pressure chambers defined therein, respectively, said first low pressure chamber having a refrigerant gas suction port opening therein; a pair of valve plates interposed between said cylinder block and said cylinder heads; means defining a suction passageway extending through said cylinder block and said valve plates at a radially outer location in said cylinder block for guiding suction refrigerant gas containing lubricant oil from said first low pressure chamber to said second low pressure chamber; and means defining a swash plate chamber at a substantially central location in said cylinder block, said swash plate chamber accommodating a swash plate secured on a drive shaft and engaging pistons slidably received within cylinder bores of said cylinder block for causing reciprocating motions of said pistons; said suction passageway defining means and said swash plate chamber defining means including a partition wall separating said suction passageway from said swash plate chamber and having an axially extending lateral wall portion and opposite radially extending end wall portions,

the improvement comprising

means defining a refrigerant gas inlet opening in said lateral



wall portion of said partition wall and communicating said suction passageway with said swash plate chamber, said refrigerant gas inlet opening having one end thereof opening in said suction passageway and directed upstream in a refrigerant gas flow in said suction passageway, at least one of said opposite end wall portions of said partition wall being formed with at least one refrigerant gas outlet opening communicating said swash plate chamber with said suction passageway;

said refrigerant gas inlet opening defining means comprising a guide wall having a radial wall portion extending into said suction passageway at a predetermined angle to the direction of said refrigerant gas flow in said suction passageway, and an axial wall portion axially extending integrally from said radial wall portion and directed upstream in said refrigerant gas flow, said refrigerant gas inlet opening being defined along said axial wall portion and said radial wall portion.

4,415,316

DOWN HOLE MOTOR

Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Apr. 27, 1981, Ser. No. 258,143

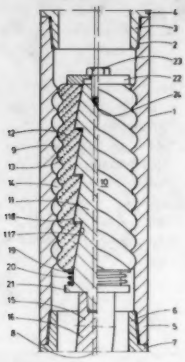
Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019308

Int. Cl.[3] **F01C** *1/107, 5/02;* **F03C** *2/08*

U.S. Cl. 418—48 **5 Claims**

1. Cutting tool direct drive moineau motor for deep-hole boring tools, consisting of a housing which a fluid can stream through in an axial primary direction from an inlet end to an outlet end and a shaft located in the housing which is rotatable and, to a limited extent, radially displaceable; the shaft and housing having molded surfaces turned toward each other which engage one another at contacting surfaces in the manner of helical gearing and mutually defining a cavity for a liquid or gaseous working (energizing) medium, which, during a passage through the cavity, traces a current path which approximates a helical path which is at least single-threaded and at least single stage; one of the two molded surfaces being formed into a molded body made of an elastically deformable material

and being supported internally by a support member; characterized by the fact that the molded body and the support are displaceable when fluid pressure acts upon the motor; and that



the contact surfaces of the elastically deformable molded body and the support member are sloped in a direction whereby the molded body is expanded thereby adjusting the seating action of the motor to the pressure of the energizing fluid.

4,415,317

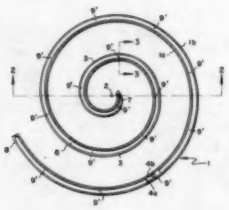
WRAP ELEMENT AND TIP SEAL FOR USE IN FLUID APPARATUS OF THE SCROLL TYPE

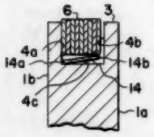
Arthur L. Butterworth, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Feb. 9, 1981, Ser. No. 232,526

Int. Cl.³ F01C *1/02, 19/08;* **F16J** *15/34*

U.S. Cl. 418—55 **39 Claims**





1. A tip seal for use in fluid apparatus of the scroll type comprising a plurality of strips of material arranged in side-by-side relationship and extending along longitudinal axes in generally spiroidal configuration about an axis, each said strip having a width measured in a generally radial direction with respect to said axis and a height measured in an axial direction, said strips being relatively flexible about an axis extending generally parallel to their height, and relatively inflexible about an axis extending generally parallel to their width.

4,415,318

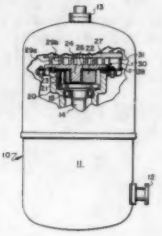
ROLLING THRUST BEARING FOR USE IN A SCROLL MACHINE

Arthur L. Butterworth, and David H. Eber, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Dec. 10, 1981, Ser. No. 329,148

Int. Cl.³ F01C *1/02, 21/02;* **F16C** *33/38, 41/02*

U.S. Cl. 418—55 **16 Claims**



1. In a positive fluid displacement apparatus of the scroll type, including an orbiting scroll plate having an attached involute wrap element, a thrust bearing comprising

a. a supporting frame;

b. a first and second bearing race, disposed respectively on the supporting frame and on a side of the orbiting scroll plate opposite the wrap element, each bearing race being of generally angular shape, having substantially flat, parallel surfaces facing toward each other, said facing surfaces moving in planar orbital motion relative to each other;

c. a bearing cage of generally annular shape disposed between the first and second bearing races and confined within an annular formation having at least one sidewall adjacent one of the first and second bearing races, said bearing cage being free to rotate about a central axis within said annular formation, and including a plurality of spaced cavities having their centers on a circle about the axis and opening onto the adjacent facing surfaces of the first and second bearing races; and

d. a plurality of ball bearings disposed within said cavities, describing orbital paths while in rolling contact with the first and second bearing races and thereby operative to transmit an axial force from the supporting frame as the first and second bearing races orbit relative to each other, said bearing cage being operative to rotate about its axis due to frictional forces resulting from the bearing cage at least intermittently coming into contact with a sidewall of the annular formation in which it is confined so that the ball bearings disposed in the cavities contact the first and second bearing races over a distributed surface area thereof, thereby extending the operational life of the thrust bearing.

4,415,319

PUMP UNIT

Naosuke Masuda; Takeshi Ohe, and Tadaaki Fujii, all of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1981, Ser. No. 291,874

Int. Cl.³ F01C *11/00, 19/08*

U.S. Cl. 418—135 **3 Claims**

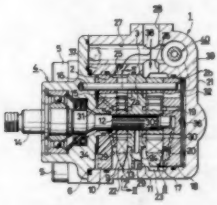
1. A vane-type pump unit, comprising:

a housing having a circular opening therein with a first section having a first diameter and a second section having a second diameter greater than said first diameter so that a step is formed therebetween;

first and second axially spaced pump sections received in said opening, one of said pump sections having a diameter conforming to one of said first and second diameters, the other of said pump sections having a diameter conforming

to the other of said first and second diameters, said pump sections together having three axially spaced sideplates, one of said sideplates being oriented between said pump sections and defining a common sideplate, said common sideplate having a stepped peripheral surface thereon conforming to each said first and second diameters, said step between the peripheral surfaces on said common sideplate engaging sid step in said opening in said housing, said first pump section confirming to said first diameter of said housing and having a first cam ring with a first cam surface thereon, and includes a first sideplate and a first side portion of said common sideplate straddling said first cam ring, said second pump section conforming to said second diameter of said housing and having a second cam ring with a second cam surface thereon, and includes said second sideplate and a second side portion of said common sideplate straddling said second cam ring;

a shaft having a pair of axially spaced rotors thereon radially aligned with a respective one of said first and second cam rings and said cam surfaces thereon, each said cam surface having a central axis radially offset from the axis of said shaft and said rotors mounted thereon, each said rotor having plural vanes reciprocally mounted thereon and slidingly engaging said respective cam surface;



first means defining an inlet for supplying fluid to a first region between a selected number of vanes of each pump section;

second means defining an outlet from a second region between a selected number of other vanes of each pump section for facilitating the outflow of pressurized fluid therefrom, said second means including a passageway communicating with (1) a first space between a first axially facing surface on said first sideplate and a first opposing surface on said housing and (2) a second space between a second axially facing surface on said second sideplate and a second opposing surface on said housing; and

first resilient means in said first space and second resilient means in said second space, said second resilient means being stronger than said first resilient means whereby it is effected that said first and second sideplates and associated first and second cam rings are urged toward said common sideplate and into tight engagement with each other, and said common sideplate is urged into engagement with and maintained in engagement with said step in said opening in said housing and, in addition, said pressurized fluid is supplied to said first and second spaced to further assist said first and second resilient means.

4,415,320

SLIDING VANE TYPE ROTARY COMPRESSOR

Teruo Maruyama, Neyagawa; Shinya Yamauchi, Katano; Shiro Yamamura, Kyoto, and Yoshiyuki Morikawa, Otsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

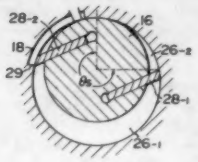
Filed Jul. 13, 1981, Ser. No. 283,041

Claims priority, application Japan, Sep. 25, 1980, 55-13048

Int. Cl.³ F04C *29/08*

U.S. Cl. 418—150 **3 Claims**

1. In a sliding vane type rotary compressor having a rotor, at least one vane slidably mounted on said rotor and said vane, and end plates fixed to both ends of said cylinder so as to close vane chambers defined by said vane, said rotor and said cylinder at both sides of said vane chamber, wherein the improvement comprises that said compressor is constructed to meet the following condition of:



$$0.025\theta_s/Vo<0.080$$

where, $\bar{a}$ is a value given by the following equation of:

$$\bar{a} = \int_0^{\theta_s} \theta^2 a(\theta) d\theta / \int_0^{\theta_s} \theta^2 d\theta$$

θ represents the angle (radian) formed around the center of rotation of said rotor between the end of said vane closer to said cylinder and the cylinder top where the distance between the inner peripheral surface of said cylinder and the outer peripheral surface of said rotor is smallest;

θ_s represents said rotation angle θ (radian) at the instant of completion of the suction stroke;

Vo represents the volume (cc) of said vane chamber when said rotation angle θ is θ_s; and

$a(\theta)$ represents the effective area (cm^2) of the suction passage between an evaporator and said vane chamber.

4,415,321

VANE COMPRESSOR HAVING A LIGHTWEIGHT ROTOR

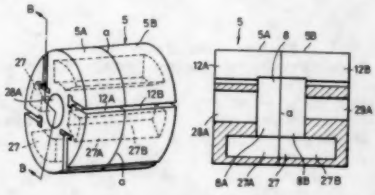
Michio Okazaki, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Mar. 17, 1981, Ser. No. 244,804

Claims priority, application Japan, Mar. 25, 1980, 55-36855

Int. Cl.³ F04C *2/344*

U.S. Cl. 418—179 **3 Claims**



1. A vane compressor comprising:

a rotary shaft;

a rotor secured on said rotary shaft for rotation in unison therewith, said rotor comprising a first rotor element and a second rotor element having end faces thereof abutting against each other and integrally joined at an axially central portion of said rotor, said first and second rotor elements comprising generally cylindrical bodies having configurations substantially similar to each other, said first and second rotor elements each having a central through bore forming space extending from an outer end thereof along an axis thereof and through which said rotary shaft

extends, a plurality of axial slit forming spaces formed in an outer peripheral surface thereof in a circumferentially spaced arrangement and extending along a whole length thereof, a back pressure chamber forming space intersecting with said central through bore forming space and opening in an inner or joining end face thereof, said back pressure chamber forming space having a diameter larger than that of said central through bore forming space, said plurality of axial slit forming spaces having axially central portions thereof communicating with said back pressure chamber forming space, and a plurality of cavity forming spaces formed between adjacent ones of said axial slit forming spaces and opening in an inner end face thereof, said plurality of cavity forming spaces communicating with said back pressure chamber forming space;

a plurality of vanes movably received in said axial slit forming spaces; and

a housing within which said rotor and said vanes are arranged, said housing cooperating with said rotor and said vanes to define pump working chambers therebetween;

said first and second rotor elements each being formed of a sintered alloy compact and being integrally joined in axial alignment by means of brazing with at least one brazing member applied on said first and second rotor elements at a joining portion thereof.

4,415,322

ROTARY MACHINE WITH CONTROLLED RETRACTABLE ELEMENTS

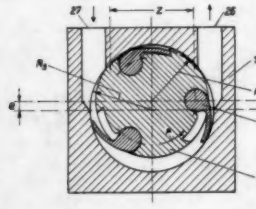
Lucien Baudin, Paris, France, assignor to IDRAM Engineering Company EST., Vaduz, Liechtenstein

Continuation of Ser. No. 944,646, Sep. 21, 1978, abandoned. This application Sep. 10, 1980, Ser. No. 185,951

Claims priority, application Switzerland, Feb. 10, 1978, 1523/78

Int. Cl.[3] **F04C** *29/10*

U.S. Cl. 418—260 **5 Claims**



1. A rotary machine, comprising:

a stator having a rotor chamber, two lateral parts, an outer casing, a fluid inlet to said rotor chamber and a fluid outlet from said rotor chamber; said rotor chamber comprising a first part-cylindrical recess and a second part-cylindrical recess which intersects said first part-cylindrical recess and has a radius greater than that of said first part-cylindrical recess; the axis of said first part-cylindrical recess being substantially parallel to and spaced from the axis of said second part-cylindrical recess, the sum of the radius of said first part-cylindrical recess and the distance between the axes of said first and second part-cylindrical recesses being greater than the radius of said second part-cylindrical recess; said fluid inlet being adjacent one extremity of said first part-cylindrical recess and said fluid outlet being adjacent the other extremity of said first part-cylindrical recess;

a cylindrical rotor rotatably secured in said rotor chamber, having a radius substantially equal to that of said first part-cylindrical recess, the axis of said rotor substantially coinciding with the axis of said first part-cylindrical recess;

a plurality of cavities in the surface of said rotor;

a plurality of blades pivotably mounted in the cavities of said rotor, having a length so as to be able to extend a distance from the rotor surface at least equal to the sum of: the difference between the radii of said first and second part-cylindrical recesses, and the distance between the axes of said first and second part-cylindrical recesses; the depth of said cavities being at least equal to the thickness of said blades; the depth of said cavities at the tips of said blades being at least as great as the difference between: the sum of the radius of said rotor and the distance between the axes of said first and second part-cylindrical recesses, and the radius of said second part-cylindrical recess;

smooth, continuous, control means attached to said blades for controlling the pivotal movement of said blades with respect to the rotor so that the tips of said blades travel in a circular path having a radius equal to that of said second part-cylindrical recess and having an axis coinciding with that of said second part-cylindrical recess;

fluid-tight moving compartments defined by said blades and said second part-cylindrical recess, said blades dividing the space between said second part-cylindrical recess and said rotor into said moving compartments with no significant dead space;

the surface of said rotor contacting said first part-cyclindrical recess to provide a zone of fluid tightness along said first part-cylindrical recess, the tips of said blades being spaced from said first part-cylindrical recess.

4,415,323

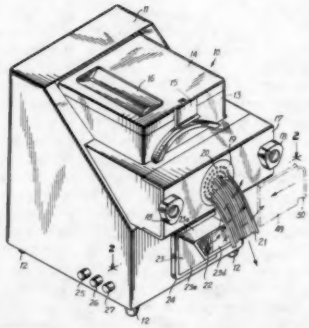
PASTA-MAKING KITCHEN APPLIANCE WITH A DRYING ARRANGEMENT

Harold Osrow, Dix Hills, and Elliott Shulman, East Northport, both of N.Y., assignors to Osrow Products Corporation, Old Bethpage, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,536

Int. Cl.[3] **A21C** *3/04, 11/16*

U.S. Cl. 425—72 S **18 Claims**



1. In a kitchen appliance for producing elongated products from farinaceous materials, a combination comprising:

(a) housing means having a support base and an internal chamber for accommodating a quantity of the respective farinaceous material and including an external wall substantially perpendicular to the support base;

(b) an extrusion die having a die plate mounted on said wall and substantially parallel to said external wall and having at least one opening communicating between said internal chamber and the exterior of said housing means;

(c) means for expelling said material through said opening in the form of the respective elongated products;

(d) means for driving said expelling means; and

(e) means for directing a stream of air against and in direct contact with the elongated product at an open-air, uncon-

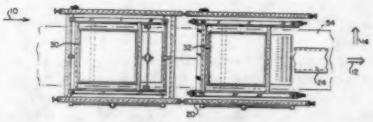
fined circumambient region of the latter adjacent to the point of the emergence thereof from said opening of said extrusion die plate for drying at least the surface of such elongated product and reducing its tackiness, said means for directing being such as to direct said airstream in an upward direction toward such elongated product from below the product for preventing surface adhesion of such elongated product with nearby surfaces.

4,415,324

APPARATUS FOR PRODUCING A MAT OF DIRECTIONALLY ORIENTED LIGNOCELLULOSIC PARTICLES HAVING CROSS-MACHINE ORIENTATION

David J. Henckel, and Thomas E. Peters, both of Boise, Id., assignors to Morrison-Knudsen Forest Products, Inc., Boise, Id.

Division of Ser. No. 230,691, Feb. 2, 1981, Pat. No. 4,347,202.
This application Feb. 10, 1982, Ser. No. 347,375
Int. Cl.³ B29B *5/02*
U.S. Cl. 425—83.1 **15 Claims**



1. An apparatus for electrostatically forming a continuous mat of directionally oriented lignocellulosic particles and depositing them on a movable mat-receiving surface in a direction substantially transverse to the length dimension of the mat-receiving surface, comprising:

an orienting zone having means establishing a first directional electric field substantially transverse to the length dimension of the movable mat-receiving surface for electrostatically orienting a multitude of lignocellulosic particles passing therethrough in the direction of the electrical field, the means configured to minimize the basis weight distribution of the lignocellulosic material deposited on the mat-receiving surface; and

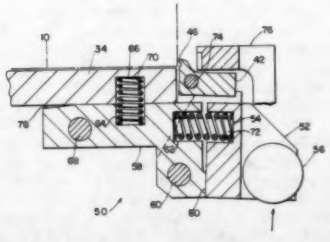
a mat-receiving surface positioned beneath the orienting zone receiving the aligned lignocellulosic particles thereon to form a mat.

4,415,325

FOLDING OF FLAT SHEET TO EXACT INTERIOR HEIGHT

Gilbert Fuchs; Norman Crowley, and Randall Wink, all of Evansville, Ind., assignors to Evana Tool & Engineering Inc., Evansville, Ind.

Filed Jun. 5, 1981, Ser. No. 270,873
Int. Cl.³ B29C *24/00*
U.S. Cl. 425—397 **19 Claims**



1. An apparatus for making a fold in a flat sheet with the folded sheet having an exact interior height comprising:

a flat shim with a folding edge, said folding edge being rounded in vertical cross section and having a thickness equal to the desired interior height;

a position means for positioning said shim on the flat sheet with said folding edge adjacent to the place where the fold is made;

a bend means for tangentially bending a portion of the flat sheet approximately 90° on said folding edge;

a die having a facing edge, said facing edge having a mating shape with respect to said folding edge; and

a push means for pushing said facing edge of said die against said folding edge of said shim such that the 90° folded portion of the sheet is further folded to approximately 180° and an exact interior height adjacent the fold is provided.

4. An apparatus for forming a flat jacket having an exact interior height by folding an elongate flat sheet having a plurality of side wings comprising:

a flat plate on which the flat sheet is located;

a flat shim having a transverse folding edge and a plurality of side folding edges corresponding to the number of side wings, said folding edges being rounded in vertical cross section and having a thickness equal to the desired interior height;

a position means for positioning said shim on the flat sheet with said folding edges adjacent to the places on the flat sheet where the folds are made;

a transverse bend means for tangentially bending a substantial portion of the sheet along a transverse line of the sheet approximately 90° on said transverse folding edge;

a transverse die having a facing edge, said facing edge having a mating surface with respect to said transverse folding edge;

a transverse push means for pushing said facing edge of said transverse die against said transverse folding edge of said shim such that the 90° folded substantial portion of the sheet is further folded to approximately 180° so that the substantial portion covers at least most of the remainder of the sheet except for the side wings and such that an exact interior height adjacent the transverse fold is provided;

a plurality of side bends means operatively associated with a respective one of said side folding edges for tangentially bending a respective one of the side wings about a respective one of said folding edges approximately 90°;

a plurality of side dies operatively associated with a respective one of said side folding edges, each said side die having a facing edge with each facing edge having a mating surface with respect to the associated side folding edge;

a plurality of side push means operatively associated with a respective one of said side dies for pushing a respective facing edge of a respective side die against a respective side folding edge of said shim such that the respective 90° folded side wing is further folded to approximately 180° so that each side wing overlaps a portion of the substantial portion of the sheet previously folded and such that an exact interior height adjacent each fold is provided; and

an attaching means for attaching said side wings to the underlying portions of the substantial portion of the sheet such that the flat jacket is provided.

4,415,326

TACTILE SENSIBILITY TESTING EQUIPMENT

Saburo Nagata, Tokyo, and Ken Nara, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

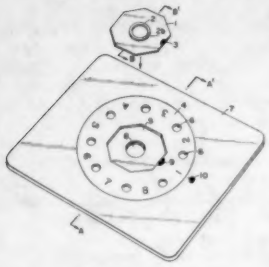
Filed Oct. 6, 1981, Ser. No. 309,161
Claims priority, application Japan, Oct. 16, 1980, 55-147616
Int. Cl.³ G09B *21/00*
U.S. Cl. 434—113 **10 Claims**

1. Tactile sensibility testing equipment comprising:

tangible means having a pattern formed thereon to be discriminated through tactile sensation;

mounting means for mounting said tangible means; and

means for rotatably supporting said mounting means, and for making said mounting means stationary at any one of a



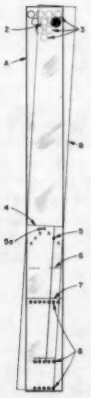
plurality of predetermined positions in its rotational direction.

4,415,327

SPARE BOWLING COMPUTER FOR SPOT BOWLERS

Floyd H. Green, Forest Park, Ill., assignor to Floyd H. Green, Forest Park, Ill.

Filed Jun. 28, 1982, Ser. No. 393,191
Int. Cl.³ G09B 9/00
U.S. Cl. 434—249 **5 Claims**



1. A two-member bowling computer to assist a spot bowler to locate his or her feet and to project a bowling ball in a direction to hit a selected pin or group of pins, the combination comprising:

a rectangular base member having the same ratio of length to width as that of a regulation bowling lane;

a representation of a bowling lane obversely visable on the base member, said bowling land representation including ten bowling pin location spots deployed in a triangular array,

a transverse line indicating a foul line that divides a bowling lane into an approach section and an alley section, seven target indicators deployed in a V-shaped array in the alley section;

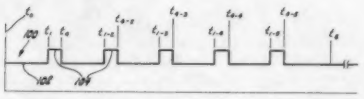
an optically transparent cover member that is spatially coextensive with the base member and that has a bowling ball indicator that is concentric with the location spot of the five-pin when the base member and the cover member are aligned.

4,415,328

FUEL AND IGNITION CONTROL

Michael T. Grunden, and William J. Roberts, both of Toledo, Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 28, 1981, Ser. No. 306,568
Int. Cl.³ F23C 11/04
U.S. Cl. 431—1 **3 Claims**



1. A fuel and ignition control for a fuel burner disposed in a combustion chamber for igniting fuel supplied to said fuel burner in response to a thermostat control signal to cause a flame, said fuel burner being operably connected to means for supplying a fluid fuel to said fuel burner, including:

probe means for supplying a spark for igniting said fuel and for detecting said flame;

spark generating means for supplying spark energy to said probe means;

valve means for stepwise controlling the flow of said fuel;

detector means responsive to said probe means for providing a first signal indicative of the presence of said flame;

said detector means including phase shift means for phase shifting said first signal slightly less than one hundred eighty electrical degrees, and first threshold means responsive to said phase-shifted first signal for providing a second signal indicative of the presence of said flame and for controlling said valve means;

first storage means for storing energy to control the operation of said valve means for a first predetermened time;

second storage means for storing energy to operate said valve means;

second threshold means for causing a third threshold means to become conductive to supply energy from said second storage means to said valve means, said second threshold means being responsive to said third threshold means for rendering said third threshold means nonconductive to pulsewise deplete said first storage means and to pulsewise provide energy from said second storage means to said valve means for said first predetermined time;

said first threshold means pulsewise intermittently providing energy from said second stoage means to said valve means when said flame is present;

purge means for purging said combustion chamber;

first digital timer means operatively coupled to said purge means for operating said purge means for at least a second predetermined time period, said first digital timer means being operatively connected to said spark generating means to permit said spark generating means to begin to supply said spark energy at a third predetermined time subsequent to said second predetermined time period, said first digital timer means being operably connected to said second threshold means to allow said second threshold means to cause said third threshold means to become conductive to operate said valve means during said third predetermined time, said first digital timer means further being operatively connected to said spark generating means to cause said spark generating means to stop supplying said spark energy at a fourth predetermined time, said first digital timer means being further operatively connected to said second threshold means to prevent said second threshold means from causing said third threshold means to become conductive to operate said fuel valve means at a fifth predetermined time, said fourth predetermined time and said fifth predetermined time being subsequent to said second predetermined time period;

first digital counting means operably connected to said first digital timer means for controlling said first digital timer

to cause said first digital timer to operate said purge means, said spark generating means, and said second threshold means for a first predetermined number of repetitions;

whereby said ignition system, in response to said thermostat control signal repetitively sequentially purges said combustion chamber, and then operates said fuel valve means and said spark generating means for a predetermined number of repetitions unless the presence of said flame is sensed and thereafter maintains said fuel valve means in an energized condition.

4,415,329

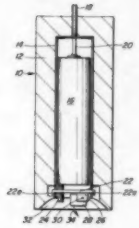
WAX-ENCASED BUTANE SAFETY CANDLE

Murray B. Dodd, 5 Brookbanks Dr., #1502, Don Mills, Ontario, Canada M3A 2S8

Filed May 3, 1982, Ser. No. 374,495

Int. Cl.³ F23N *5/24*

U.S. Cl. 431—125 **3 Claims**



1. A candle having an interior, cylindrical metal casing open at its bottom and having a unitary, central, upwardly extending tube;

a wax shell surrounding said casing, said tube extending through said shell;

said casing having a pair of diametrically opposed slots near its bottom, one of said slots opening at one end to the bottom of said casing;

said slots being adapted to retain a removable control plate having a finger mounted for pivotal movement on its underside, near one side thereof, said finger extending below the bottom of said wax shell, when pivoted to its down position;

a set screw in said control plate on the side opposite said finger;

said casing being adapted to contain a butane cylinder having a nozzle-valve at its top center adapted to be received in said tube and to be retained in said cylinder by said control plate;

whereby, when said finger is in its down position and the candle is placed on a flat surface the weight of said candle on said finger will urge said control bar and its set screw, and thus said butane cylinder, upwardly therein to open said nozzle-valve.

4,415,330

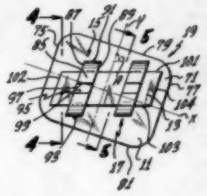
ORTHODONTIC BRACKET ASSEMBLY

Richard J. Daisley, Ontario, and Lawrence S. Ring, Glendora, both of Calif., assignors to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 36,258, May 4, 1979, abandoned. This application Aug. 31, 1981, Ser. No. 343,605

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—16 **1 Claim**



1. An orthodontic bracket assembly for use with an archwire to impart corrective forces on a tooth, including:

a base pad for attachment to the tooth,

a distal tie wing fixed to said base pad and including a gingival tip and an occlusal tip defining between them an archwire slot,

a mesial tie wing fixed to said base pad and including a gingival tip and an occlusal tip defining between them an archwire slot, each of said distal and mesial tie wings having parallel distal and mesial sides,

said archwire slots being in mutual alignment and providing a reference line for orientation parallel to the occlusal plane of a patient,

said sides of said tie wings are inclined at an oblique angle to said reference line, whereby said tie wings can be generally vertically disposed parallel to the tooth long axis and still be inclined at an oblique angle to said reference line,

said gingival tips and said occlusal tips of said tie wings having respectively top and bottom surfaces which are in mutual alignment parallel to said reference line and substantially equidistant therefrom,

whereby said tie wings together form a rhomboidal configuration and the axis of said archwire slots bisects said tie wings so that said gingival tips and said occlusal tips are of equal size.

4,415,331

PROCESS FOR CHEMICALLY SCULPTURING WOOL PILE FABRICS

Joseph H. Dusenbury, and Daniel T. McBride, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 11, 1982, Ser. No. 357,008
Int. Cl.³ D06Q *1/02*
U.S. Cl. 8—114.6 3 Claims

1. A process for sculpturing a pile fabric having pile fibers made from wool, or wool-nylon blends, which comprises: treating said wool by oxidizing its disulfide bonds accompanied by acid hydrolysis; contacting the pile surface of said fabric with a fiber degrading composition, said composition comprising a fiber degrading agent in a concentration sufficient to reduce the tensile strength of the fibers of the pile in the selected areas so that said pile fibers may be removed by mechanical action; said fiber degrading agent being an aromatic sulfonic acid having a pK_a value of less than about 2; said fiber degrading composition further containing a diluent for said fiber degrading agent, heating said pile fabric to a temperature sufficient to cause the tensile strength of said fibers of said pile in the selected areas to be reduced sufficiently so that said fibers may be removed by mechanical means, but said temperature being low enough so as not to result in complete destruction of the fiber integrity prior to removal by mechanical means; and removing said degraded portion of said pile fibers by mechanical means to provide a sculptured pile fabric.

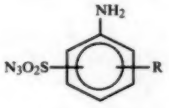
4,415,332

DEVELOPMENT OF COLOR IN A POLYAMIDE TEXTILE MATERIAL WITH AMINOBENZENESULFONYL AZIDES

Ronald S. Lenox, and Charles E. Hoyle, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 30, 1982, Ser. No. 429,333
Int. Cl.³ D06P *5/20*
U.S. Cl. 8—444 8 Claims

1. A method of photolytically developing color on a polyamide material, which comprises treating the material by contacting it with an aminobenzenesulfonyl azide of the formula



wherein R is H, A C_1–C_4 alkoxy group or a C_1–C_4 alkyl group, or a salt thereof, and exposing the treated material to a UV light source to thereby develop color on the material.

4,415,333

SOLID COMPOSITIONS OF WATER-SOLUBLE FIBER-REACTIVE DYESTUFFS AND DIALKYLNAPHTHALENE SULFONIC ACID AND FORMALDEHYE CONDENSATE

Ludwig Schläfer, Kelkheim, and Heinz Uhrig, Steinbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,401
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111488
Int. Cl.³ C09B *67/24;* D06P *1/38*
U.S. Cl. 8—524 18 Claims

1. A solid composition of fiber-reactive dyestuffs, which contains a condensation product formed from a dialkylnaphthalenesulfonic acid, or a mixture thereof, and formaldehyde.

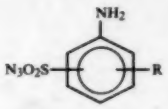
4,415,334

THERMAL DEVELOPMENT OF COLOR IN A POLYAMIDE TEXTILE MATERIAL WITH AMINOBENZENESULFONYL AZIDES

Charles E. Hoyle, and Ronald S. Lenox, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 29, 1982, Ser. No. 427,516
Int. Cl.³ C09B *29/00*
U.S. Cl. 8—694 8 Claims

1. A method of thermally developing color on a polyamide material, which comprises treating the material by contacting it with an aminobenzenesulfonyl azide of the formula



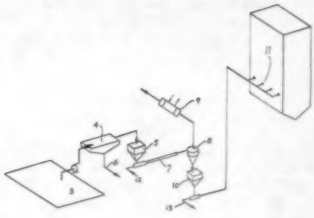
wherein R is H, a C_1–C_4 alkoxy group or a C_1–C_4 alkyl group, or a salt thereof, and heating the treated material at a temperature ranging from 80° C. to the melting point of the polyamide material to thereby develop color on the material.

4,415,335

COAL PREPARATION

David E. Mainwaring, and Charles U. Jones, both of Melbourne, Australia, assignors to B. P. Australia Ltd. and The Broken Hill Proprietary Company Ltd., both of Melbourne, Australia

PCT No. PCT/AU81/00055, § 371 Date Jan. 7, 1982, § 102(e) Date Jan. 7, 1982, PCT Pub. No. WO81/03337, PCT Pub. Date Nov. 26, 1981
PCT Filed May 12, 1981, Ser. No. 341,981
Claims priority, application Australia, May 13, 1981, PE 3515
Int. Cl.³ C10L *9/08, 9/00*
U.S. Cl. 44—1 C 2 Claims



1. A method of separating an agglomerated mixture of finely divided coal particles and a liquid hydrocarbon to recover the hydrocarbon liquid and the coal as finely divided particles comprising:

providing a conduit having a first end and a second end;

introducing agglomerates of said coal particles and liquid hydrocarbon into said conduit adjacent said first end;

contacing said agglomerates with steam at tempertures in excess of 200° C. to separate the liquid hydrocarbon from its association with said coal particles and to disintegrate said agglomerates into finely divided particles suspended in said steam and entrained liquid hydrocarbon;

passing said separated coal particles and hydrocarbon liquid out of said second end of said conduit within 5 seconds of the steam contacting said agglomerates; and

separating sequentially said coal particles and liquid hydrocarbon from said steam.

2. A method as in claim 1 wherein:

all of said agglomerates are above 1 mm. in size;

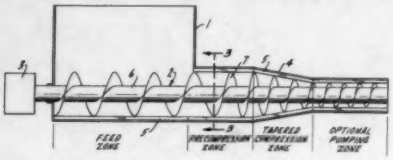
at least 70 percent of the coal particles comprise particles less than 0.3 mm. in size; and

the final product oil content is less than 2.5 percent.

4,415,336
METHOD AND APPARATUS FOR CONTINUOUS PUMPING OF COMPRESSIBLE SOLIDS AGAINST HIGH PRESSURES

Michael A. Stasi, Downers Grove; Walker H. Bowman, St. Charles, and Edward F. Rader, Wheaton, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 11, 1981, Ser. No. 272,486
Int. Cl.³ C10L 5/08
U.S. Cl. 44—13 **3 Claims**



1. A method for compressing a low density, compressible bulk solid material comprising biomass and containing from about 10 to about 45 weight percent water which comprises feeding said material into a high pressure environment of a least 2000 psi by continuously conveying the material through a screw extruder comprising:

(a) Introducing the material into a feed zone wherein the material is engaged by an extruder screw without compression;

(b) Conveying the material to a precompression zone wherein the extruder screw has a constant or changing pitch;

(c) Compressing the material in a tapered compression zone comprising a conical extruder barrel section and a corresponding conical screw section; and

(d) Further compressing and conveying the material within a pumping zone having a constant root diameter, constant pitch, and constant barrel diameter such that the design compression ratio of the screw extruder is from 50 to 100 percent of the compression ratio of the solid material being conveyed.

4,415,337
METHOD FOR PRODUCING AGGLOMERATE PARTICLES FROM AN AQUEOUS FEED SLURRY COMPRISING FINELY DIVIDED COAL AND FINELY DIVIDED INORGANIC SOLIDS

Helmuth W. Kutta, and Donald K. Wunderlich, both of Richardson, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 5, 1982, Ser. No. 374,838
Int. Cl.³ C10L 9/10
U.S. Cl. 44—24 **8 Claims**

1. A method for producing coal agglomerates from an aqueous feed slurry containing from about 10 to about 40 weight percent solids, said solids comprising finely divided coal and finely divided inorganic solids, said method consisting essentially of

(a) admixing a quantity of oil equal to from about 25 to about 75 percent of the oil required to produce said coal agglomerates with said slurry;

(b) thereafter mixing an aqueous solution of a polymeric material selected from the group consisting of vinyl acetate, polyvinyl chloride, vinyl acetate/acrylic polymers, styrene-butadiene, acrylic latex or resins, natural gums and resins, tall oil, neoprene and rubber in an amount sufficient to produce said coal agglomerates with said slurry; and,

(c) recovery said coal agglomerates.

3. The method of claim 1 wherein said polymeric material is vinyl acetate/acrylic copolymer.

4,415,338
AQUEOUS CARBONACEOUS SLURRIES

Martin J. Schick, New York, N.Y., and Kathy A. Knitter, San Francisco, Calif., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jun. 10, 1982, Ser. No. 387,176
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 **23 Claims**

1. A stabilizer composition for aqueous carbonaceous slurries comprising:

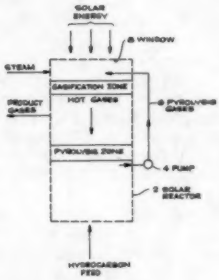
(a) at least one dispersant selected from the group consisting of the sodium, lithium, potassium and ammonium salts of naphthalenesulfonic acid formaldehyde condensate, and

(b) at least one water soluble polymer selected from the group consisting of gum karaya, mixtures of gum karaya and polyacrylamide, and polysaccharides modified with polyacrylate.

4,415,339
SOLAR COAL GASIFICATION REACTOR WITH PYROLYSIS GAS RECYCLE

William R. Aiman, Livermore, and David W. Gregg, Morago, both of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 6, 1981, Ser. No. 251,662
Int. Cl.³ B01J 3/00; F23J 3/02
U.S. Cl. 48—62 R **10 Claims**



1. A method of producing a substantially hydrocarbon-free product gas with a solar reactor from a carbonaceous-material feed, said method comprising the steps of:

transmitting said feed into said solar reactor;

directing solar energy into said solar reactor producing a gasification zone spaced from said feed entry by generating hot gases from said feed, said hot gases producing a pyrolysis zone between said gasification zone and said feed entry, with pyrolysis gases and char being produced at said pyrolysis zone;

withdrawing said pyrolysis gases from said pyrolysis zone;

inserting said pyrolysis gases between the solar energy reactor entry and said gasification zone, which is spaced from said pyrolysis zone and said feed entry; and

withdrawing substantially hydrocarbon-free product gas from said reactor between said gasification zone and said pyrolysis zone.

7. A solar carbonaceous-material gasification apparatus, comprising:

a solar energy reactor;

means for transmitting a feed into said reactor;

means for directing solar energy into said reactor onto said feed which includes a solar energy reactor entry means; thereby producing a gasification front, by generating gases from said feed, and producing a pyrolysis front;

means for withdrawing generated gases below said pyrolysis front and injecting said withdrawn gases between said

solar energy reactor entry means and said gasification front; and

means for withdrawing product gases from said reactor.

4,415,340
ADSORPTIVE SEPARATION OF GASES

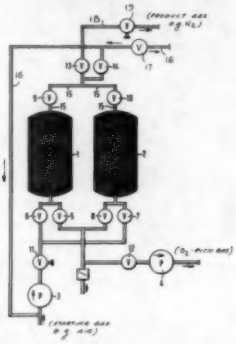
Karl Knoblauch, and Heinrich Heimbach, both of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 166,096, Jul. 3, 1980, abandoned. This application Apr. 13, 1982, Ser. No. 367,971

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932333

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—25 **7 Claims**



1. In a process of adsorptively separating nitrogen from a gas mixture composed of at least nitrogen and oxygen by alternatingly adsorbing and desorbing oxygen on molecular-sieve coke contained in at least two vessels, of the type in which a stream of gas mixture is passed through a previously desorbed one of the vessels so that a stream of product gas consisting essentially of nitrogen issues from an outlet of said one vessel; the passage of the stream is terminated when the molecular-sieve coke in the one vessel has adsorbed oxygen to a predetermined extent; the inlet and outlet of said one vessel are connected with the inlet and outlet of the other desorbed vessel, so as to pressure-equalize said vessels; said vessels are disconnected from one another; and a stream of the gas mixture is passed through said other vessel so that a stream of the product gas begins to issue from the outlet of the other vessel, the improvement comprising diverting the stream of product gas from its normal path during a predetermined brief period starting at the initiation of its flow from said outlet of said other vessel so that an initial part of the product gas which contains an oxygen peak is not used, and thereafter a following part of the product gas which no longer contains the oxygen peak flows in its normal path to be used.

4,415,341
GAS, LIQUID CONTACTOR

J. Paul Echtler, Pittsburgh, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed May 13, 1982, Ser. No. 377,650

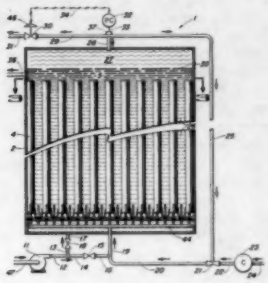
Int. Cl.³ B01D *18/00*

U.S. Cl. 55—53 **6 Claims**

1. A method of turbulent high pressure mixing of gas and liquid at pressures greater than 200 psig comprising:

(a) providing container means, said container means being provided with a plurality of conduits and a plurality of gas inlet means, each said gas inlet means comprising an inlet distributor tube having an opening, each said conduit being substantially linear and having a lower portion and an upper portion, each said conduit upper portion including an uppermost opening of said conduit; and positioned within the lower portion thereof each said conduit having at least one of said inlet distributor tube openings, and;

liquid in said container means being maintained at a level above said upper portion of said conduits whereby liquid is recirculated,



(b) passing gas at a pressure greater than 200 psig through each said gas inlet means and through each said conduit,

(c) passing liquid through said each conduit concurrent to the flow of gas at pressure greater than 200 psig and in turbulent flow while within said conduits, whereby said gas and liquid are mixed by the turbulence.

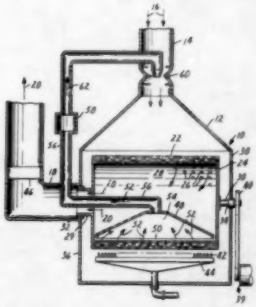
4,415,342
AIR POLLUTION CONTROL PROCESS

George D. Foss, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 190,196, Sep. 24, 1980, Pat. No. 4,348,362. This application Apr. 14, 1982, Ser. No. 368,096

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—96 **2 Claims**



1. A process for removing volatile particulate material and organic vapors from a polluted air stream, said process comprising the steps of:

a. providing said polluted air stream for entrance into an inlet plenum of an apparatus housing, said apparatus housing having a rotatable collector and burner located therein, said rotatable collector by its position being

(1) a filtering and adsorption station for particulate matter and organic vapors, and having connecting means therefrom to an outlet plenum for exhausting the resultant pollutant-free air stream, and

(2) a combustion and desorption station for combustion of particulate matter and desorption of organic vapors,

b. collecting particulate material and organic vapors from

said air stream at said filtration and absorption station in said collector to form an essentially pollutant-free effluent, said collector comprising an assembly of layers of refractory microfiber mats, metal screens, and vapor adsorbents, one of said refractory microfiber mats being on the exposed surface of said collector adjacent to said burner and being capable of withstanding temperatures of at least 600° C. produced by said burner, the microfibers having diameters in the range of 0.1 to 40 m and said microfiber mats having a thickness in the range of 2.5 to 25 mm and a bulk density in the range of 4 to 40 mg/cc, and one of said vapor adsorbent layers which is capable of withstanding temperatures up to 450° C. being on the inner surface of said collector, said collector having a pressure drop of less than 300 mm of water,

c. burning said collected particulate matter and simultaneously desorbing said collected organic vapors, at said combustion and desorption station in said collector, to form a concentrated stream comprising combustion products of particulate material and desorbed vapors,

d. oxidizing the desorbed vapors of the concentrated stream in an oxidizing means in said apparatus to form an essentially pollution-free oxidized stream comprising both particulate material combustion products and vapor combustion products, and

e. exhausting, separately, the essentially pollutant-free effluent of step b. and the essentially pollutant-free oxidized stream of step d.

4,415,343

SEALING SYSTEMS FOR FILTER BAGS

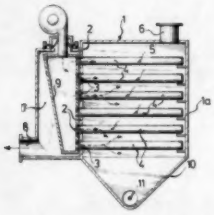
Adolf Margraf, Am Schleplingsbach 46, D-3060 Stadthagen, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,787

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127926

Int. Cl.³ B01D *46/02*

U.S. Cl. 55—379 **1 Claim**



1. In a sealing system for the aperture rims of cross-sectionally shallowly oval filter bags which are to be cleansed by counterflow scavenging and/or shaking, situated at the clean gas side of a partition subdividing the casing of a bag filter into a dedusting space and a pure gas space and provided with shallowly oval perforations, in each case by means of a shallowly oval transversely overbridged clamping frame springily enclamping the filter bag aperture rim between itself and the partition, the bridging element of which bears the thrust of the spring system which on the other hand bears under loading against said dust gas side of said partition, said filter bags inserted into said dedusting space via said perforations and each supported at its free end and having a rigid internal spacing element terminating before said partition, and which is supported in front of said partition by parts of said clamping frame, the invention which consists in that a spindle passes through an aperture in said bridging element of each said clamping frame in rotatable and longitudinally displaceable manner said spindle being firmly joined at said dust gas side of said bridging element with a clamping strap the length of which is greater than the lateral width of said shallowly oval partition perforation and is surrounded at said clean gas side by a compression spring which is situated between said bridging element and a spindle stop, said clamping strap being placeable under stress by axial displacement of said spindle.

4,415,344

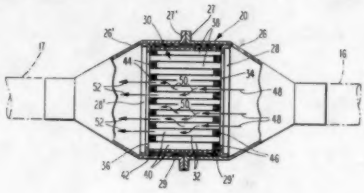
DIESEL PARTICULATE FILTERS FOR USE WITH SMALLER DIESEL ENGINES

Rodney I. Frost, Corning, and Max R. Montierth, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,803

Int. Cl.³ B01D *39/20*

U.S. Cl. 55—523 **17 Claims**



1. In an exhaust system for use with a light duty vehicle diesel engine emitting particulates at a rate of less than about 0.45 gm./mile in a normal driving cycle and comprising conduit means for carrying engine exhaust gases away from the engine for disposal into the atmosphere, a solid particulate filter positioned within the conduit means across the exhaust gas path comprising:

a multiplicity of thin, interconnected walls defining at least one open inlet end face in communication with the exhaust gas upstream from the filter and at least one open outlet end face in communication with exhaust gas downstream from the filter and a multiplicity of cells each extending through the matrix from at least one of said open end faces;

the thin walls having internal interconnected open porosity of a volume and mean pore diameter sufficient to enable the fluid to flow through the thin walls and to restrain at least a significant portion of the particulates from passing completely through the thin walls in any direction;

an inlet group of the cells each open only at at least one of the inlet end faces;

an outlet group of the cells each open only at at least one of the outlet end faces and closed proximal to each inlet end face; and

the volume of the internal open porosity of the thin walls and the mean diameter of the pores forming the open porosity further lying within the area defined by the boundary lines connecting the points A-B-C-D in FIG. 5.

4,415,345

PROCESS TO SEPARATE NITROGEN FROM NATURAL GAS

Brian R. Swallow, Media, Pa., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 26, 1982, Ser. No. 362,048

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—28 **13 Claims**

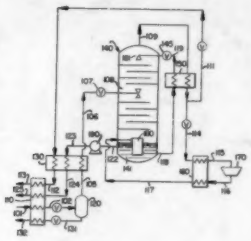
1. A process for separating nitrogen from natural gases comprising:

(a) providing a natural gas feed stream having a nitorgen concentration, which varies over time, of from 1 to 35 percent;

(b) introducing said nitrogen-containing natural gas stream into a fractionation column operating at a pressure of from 15 to 125 psia;

(c) separating by recitification said nitrogen-containing natu-

ral gas stream into a nitrogen-enriched vapor portion A and a methane-enriched liquid portion B;
(d) providing a nitrogen-containing vapor stream C;
(e) warming said nitrogen-containing vapor stream C;
(f) compressing the warming nitrogen-containing vapor stream C to a pressure of from about 50 to 470 psia;
(g) cooling the compressed nitrogen-containing stream C by indirect heat exchange with the warming nitrogen-containing stream of step (e);
(h) condensing the cooled compressed nitrogen-containing



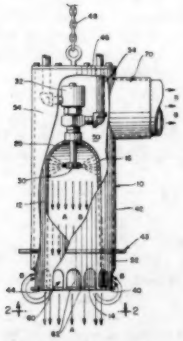
stream C by indirect heat exchange with said methane-enriched liquid portion B, thereby providing vapor reflux to the fractionation column;
(i) throttling the condensed nitrogen-containing liquid stream C to about the pressure of the fractionation column;
(j) employing the throttled nitrogen-containing liquid stream C to provide liquid reflux for the fractionation column; and
(k) recovering at least a portion of said methane-enriched portion B as product natural gases.

4,415,346

CARBON DIOXIDE SNOW HORN FOR DRY ICE PRODUCTION

James H. Love, 3909 Woodland Ave., Western Springs, Ill. 60558

Filed Oct. 11, 1978, Ser. No. 950,513
Int. Cl.³ F25J *1/02*
U.S. Cl. 62—35 **11 Claims**



1. A snow horn device for producing solid CO_2 particles from CO_2 in its liquid form, comprising:
(a) a downwardly directed skirt having a truncated, conically tapering shape which is open at its lower, larger diameter end;
(b) a hemispherically-shaped head mounted at the top, smaller diameter end of said skirt; and
(c) nozzle means located effectively at the radial center of said hemispherically-shaped head, said nozzle means having orifices formed therein which are generally outwardly directed from the longitudinal axis of said skirt for allowing the expansion of said liquid CO_2 from said nozzle means whereby the solid CO_2 particles thereby formed will impinge against the inner surfaces of said head and skirt and be deflected substantially downwardly by said surfaces at a reduced velocity, thereby avoiding turbulence in the area of said head.

7. In a snow horn device for producing solid CO_2 particles and gas from CO_2 in its liquid form at ambient temperature and pressure, wherein the snow horn has a nozzle means mounted in a head which is mounted at the top of a skirt which has an open lower end, the improvement comprising:
(a) an outwardly directed annular flange mounted about the lower end of said skirt;
(b) a concentric hood mounted at its lower edge to said annular flange so as to form an enclosed chamber about said head and skirt;
(c) a port means opening into said enclosed chamber about the lower edge of said hood; and
(d) an exhaust means opening into said enclosed chamber at its upper end for drawing said CO_2 gas through saidport means and out of said enclosed chamber, whereby the direction of flow of said gas is abruptly rotated through 270 degrees from the direction of gas flow downwardly through said skirt.

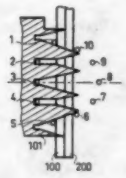
8. A snow horn device as claimed in claim **1**, further comprising:
an outwardly directed annular flange mounted about the lower end of said skirt;
a concentric hood mounted at its lower edge to said annular flange so as to form an enclosed chamber about said head and skirt;
a port means opening into said enclosed chamber about the lower edge of said hood; and
an exhaust means opening into said enclosed chamber at its upper end for drawing said CO_2 gas through said port means and out of said enclosed chamber, whereby the direction of flow of said gas is abruptly rotated through 270° from the direction of gas flow downwardly through said skirt.

4,415,347

DEVICE AND METHOD FOR PREPARING MULTI-FIBER OPTICAL CABLES FOR BUTT-JOINTING

Jean L. Malinge; Marie C. Soster, and Dominique Lamarche, all of Paris, France, assignors to Socapex, Suresnes, France

PCT No. PCT/FR81/00115, § 371 Date Dec. 15, 1981, § 102(e) Date Dec. 15, 1981
PCT Filed Sep. 4, 1981, Ser. No. 333,862
Claims priority, application France, Sep. 5, 1980, 80 19255
Int. Cl.³ C03B *37/10, 37/14*
U.S. Cl. 65—4.21 **17 Claims**



12. A method of preparing a multi-fiber optical cable, of the type wherein the individual fibers are circularly arranged, for butt-jointing the ends of the fibers with the ends of other fibers of a multi-fiber optical cable, said method comprising the steps of:
(a) moving a comb-like structure defining alternating plural teeth and plural recesses in an approaching direction relative a first grouping of individual fibers of the cable to

dispose individual ones of the teeth between adjacent ones of the individual fibers of the first grouping; and

(b) allowing the individual fibers of the first grouping to be received in respective ones of the recesses so as to linearly dispose the ends of the individual fibers of the first grouping.

4,415,348

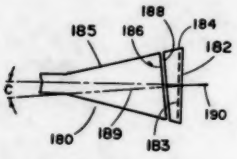
METHOD OF MANUFACTURE FOR PROJECTION TELEVISION SYSTEM

Stanley E. Lehnert, Addison, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Division of Ser. No. 154,197, May 29, 1980, Pat. No. 4,393,329, which is a continuation-in-part of Ser. No. 110,413, Jan. 8, 1980, Pat. No. 4,274,110. This application Jun. 1, 1982, Ser. No. 383,860

Int. Cl.³ C03B *23/217*

U.S. Cl. 65—58 **1 Claim**



1. For use in the manufacture of a projection television system having at least one cathode ray picture tube whose projection optical axis is displaced from the axis of a remotely located viewing screen by an angle A, and with a cathodoluminescent imaging screen whose axis is substantially coincident with said projection optical axis and normally coincident with the electron-optical axis of said tube, said imaging screen providing an electron-formed visible image for projection on said viewing screen, said cathode ray picture tube having a conjoinable face panel and funnel which mate along interfacing edges, a method for compensating for the non-linear magnification distortion of the projected image caused by the location of said tube off the viewing screen axis, comprising:

forming the seal edge of said funnel to define a plane whose normal makes an angle with respect to the funnel axis substantially equal to one-half said angle A;

forming the seal edge of said face panel to define a plane whose normal makes an angle with respect to the imaging screen axis substantially equal to one-half said angle A;

aligning said funnel with respect to said face panel to tilt said electron-optical axis with respect to said projection optical axis by an angle B substantially equal to said angle A; and

conjoining said seal edges;

such that the value of said angle B and the orientation of said electron-optical axis causes said electron-formed visible image to have an orientation and non-linear magnification distortion effective to substantially compensate for the off-axis-induced, non-linear magnification distortion of the light image projected thereby on said viewing screen.

4,415,349

METHOD AND APPARATUS FOR COOLING GLASS FURNACE FOREHEARTH

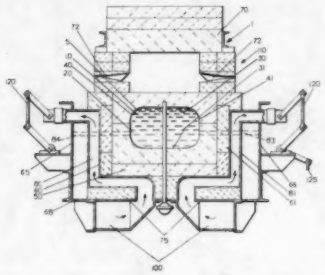
John H. Engstrom, and Robert W. Ellis, both of Vineland, N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 15, 1982, Ser. No. 368,605

Int. Cl.³ C03B *5/23*

U.S. Cl. 65—137 **7 Claims**

1. A glass furnace forehearth comprising a firebrick hearth that is generally rectangular in cross section and has a central interior cavity for cooling and fining molten glass as the glass travels within the cavity from the entrance to the exit of the forehearth, the central cavity being defined by generally parallel top and bottom interior wall surfces and generally parallel side surfaces that are generally elliptical in shape, the forehearth comprising a furnace bottom below the hearth, a furnace sidewall located on each side of the hearth and spaced apart generally parallel along the longitudinal axis of the forehearth, a firebox located over the top of the hearth, insulation located between the bottom of the hearth and the bottom of the furnace, sidewall insulation located on each side of the hearth betweenthe hearth side and the furnce sidewall, there being provided cooling means for cooling the hearth sidewalls and hearth bottom including a plurality of air ducts located in the bottom insulation and the sidewall insulation, the air ducts being spaced generally along the longitudinal axis of the forehearth, each air duct disposed generally in a direction perpendicular to the longitudinal axis of the forehearth, each duct being so constructed and arranged that it has a contacting side that contacts its adjacent associated forehearth bottom and the



adjacent sidewall substantially the length of the contacting side, the area of the contacting sides being at least about 30% of the area of the forehearth bottom and the sidewalls, the cooling means including means for forcing air through the air ducts, and there being provided means for heating and cooling the top of the hearth in the firebox to thereby provide for cooling on the top, bottom and both sides of the hearth.

6. A method of cooling a molten stream of glass flowing in a firebrick hearth from an entrance end to an exit end of a glass furnace forehearth, the method comprising the steps of: providing an air duct adjacent the forehearth bottom having contacting sides that contact the bottom over at least about 30% of the area of the bottom; cooling the bottom of the hearth which cools the molten glass by forcing air through the ducts in the hearth bottom insulation; providing contacting sides of air ducts that contact the forehearth sidewalls over at least about 30% of their area; cooling each side of the hearth which cools the molten glass by forcing air through the ducts along the side of the hearth.

4,415,350

AUXIN COMPOSITIONS OF PHENYL THIOESTERS OF INDOLE-3-ALKANOIC ACIDS AND THEIR USE AS AUXIN GROWTH REGULATORS

David A. Boyles; Jack R. Gaines, both of Rapid City, S. Dak., and Bruce E. Haissig, Rhinelander, Wis., assignors to The United States of America as represented by the Department of Agriculture, Washington, D.C.

Filed Apr. 12, 1982, Ser. No. 367,638

Int. Cl.³ A01N *43/38;* **C07D** *209/18*

U.S. Cl. 71—77 **4 Claims**

1. A synthetic auxin composition for stimulating adventitious root formation in difficult-to-root cuttings, comprising an amount sufficient to stimulate adventitious root formation of a compound or mixture of compounds selected from the group consisting of phenyl indole-3-thiol lower alkylene esters

wherein the alkylene ester group has up to 4 carbons; and a volatile or inert non-toxic carrier.

4. A method of stimulating adventitious root formation of plant cuttings comprising contacting the stem of a plant cutting with a phenyl indole-3-thiol lower alkylene ester wherein the alkylene ester group has up to 4 carbons or a mixture thereof; and maintaining said cutting in an environment for developing roots on the stem of said cutting until the roots develop to an extent that said cutting is suitable for transplanting.

4,415,351

METHOD OF INCREASING THE YIELD OF LEGUMES UTILIZING O,O-DIALKYL DITHIOPHOSPHORYL ACETYL-N-ALKYL GLYCINE AMIDES

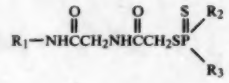
Llewellyn W. Fancher, New Castle; Francis H. Walker, Mill Valley, and Lawrence L. Buren, Cupertino, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 26, 1981, Ser. No. 296,287

Int. Cl.³ A01N *57/12*

U.S. Cl. 71—87 **5 Claims**

1. A method of increasing the yield of legumes comprising applying thereto a yield-increasing amount of a compound having the formula



wherein R_1 is selected form the group consisting of $—CH_3$, $—C_2H_5$, $—C_3H_7$ and $—C_4H_9$, and R_2 and R_3 are independently selected from the group consisting of $—OCH_3$, $—OC_2H_5$ and $—OC_3H_7$.

4,415,352

HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 196,518, Oct. 14, 1980, abandoned, which is a division of Ser. No. 930,967, Aug. 4, 1978, Pat. No. 4,269,618, which is a division of Ser. No. 208,041, Dec. 9, 1971, Pat. No. 4,137,070, which is a continuation-in-part of Ser. No. 134,868, Apr. 16, 1971, abandoned. This application Apr. 16, 1982, Ser. No. 369,322

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.³ A01N *43/00, 37/00*

U.S. Cl. 71—88 **15 Claims**

1. A herbicidal composition comprising an active thiolcarbamate herbicide and a non-phytotoxic antidotally effective amount of an N-furylmethyl or an N-tetrahydrofurylmethyl alkyl substituted amide of dichloroacetic acid, said amide being antidotally active with said thiolcarbamate herbicide.

4,415,353

HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 369,322, Apr. 16, 1982, which is a division of Ser. No. 196,518, Oct. 14, 1980, abandoned, which is a division of Ser. No. 930,967, Aug. 4, 1978, Pat. No. 4,269,618, which is a division of Ser. No. 208,041, Dec. 9, 1971, Pat. No. 4,137,070, which is a continuation-in-part of Ser. No. 134,868, Apr. 16, 1971, abandoned. This application Nov. 15, 1982, Ser. No. 441,963

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.³ A01N *37/00, 37/18*

U.S. Cl. 71—100 **8 Claims**

1. A herbicide composition comprising an active thiolcarbamate herbicide and a non-phytotoxic, antidotally effective amount of an amide of dichloroacetic acid, said amide of dichloroacetic acid being antidotally active with said thiolcarbamate herbicide, provided that said amide is other than a N,N-dihydro or a N-hydro, N-halophenyl amide of dichloroacetic acid.

4,415,354

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

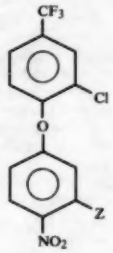
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 111,560, Jan. 14, 1980, Pat. No. 4,330,324, which is a division of Ser. No. 881,227, Feb. 22, 1978, Pat. No. 4,220,468, which is a division of Ser. No. 719,484, Aug. 31, 1976, Pat. No. 4,093,446, which is a continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, Pat. No. 4,063,929, and Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, said Ser. No. 617,560, is a continuation-in-part of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276, said Ser. No. 617,562, is a division of Ser. No. 331,719,. This application Sep. 16, 1981, Ser. No. 302,896

Int. Cl.³ A01N *37/38, 41/04, 33/16*; C07C *143/68*

U.S. Cl. 71—103 **10 Claims**

1. A compound of the formula



wherein Z is a group of the formula (1) $—OSO_2CH_3$, (2) $—OCH(CH_3)CO_2CH_2CH{=}CH_2$, or (3) $—OCH(CH_3)C(NOH)CH_3$.

7. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound according to claim 1 in an amount sufficient to control the growth of the weeds.

4,415,355

DINITROANILINE HERBICIDAL COMPOSITIONS CONTAINING FREEZING POINT DEPRESSANT ADDITIVES

Ronald L. Cassell, New Palestine, Ind., and Thomas N. Hall, Baton Rouge, La., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

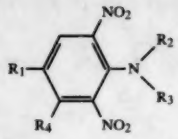
Filed Sep. 1, 1981, Ser. No. 298,648

Int. Cl.³ A01N *25/22*

U.S. Cl. 71—121 **6 Claims**

1. A herbicidal composition comprising

A. a dinitroaniline compound having the following structural formula



wherein R_1 is a radical selected from the group consisting of methyl and trifluoromethyl; R_2 is a radical selected from the group consisting of hydrogen, cycloalkyl and lower alkyl radicals, either straight chain or branched, having 1 to 5 carbon atoms; and R_3 is a radical selected from the group consisting of lower alkyl, lower chloroalkyl, and lower cyanoalkyl radicals said radicals being either straight chain or branched and having 1 to 5 carbon atoms; and R_4 is a radical selected from the group consisting of methyl and hydrogen; and

B. a freezing point depressant compound selected from the group consisting of butyrolactone, N,N-dimethyl-formamide, and mixtures thereof.

4,415,356

PROCESS FOR AUTOGENOUS OXYGEN SMELTING OF SULFIDE MATERIALS CONTAINING BASE METALS

Grigori S. Victorovich, and Malcolm C. Bell, both of Toronto, Canada, assignors to Inco Limited, Toronto, Canada

Filed Oct. 13, 1981, Ser. No. 310,524

Claims priority, application United Kingdom, Oct. 1, 1980, 8035134; Nov. 4, 1980, 8035417

Int. Cl.³ C22B *1/02*

U.S. Cl. 75—21 **16 Claims**

1. A smelting process in which a sulfide material containing metal sulfide values and iron sulfide is combusted autogenously with an oxygen-containing gas comprising roasting a portion of the sulfide material to be smelted, blending the thus roasted portion with unroasted sulfide material, and autogenously smelting the resulting blend of roasted and unroasted material with oxygen in a bounded space and in the presence of a flux for iron oxides to produce a molten metal product, a molten silicious slag and a strong sulfur dioxide off-gas, whereby the grade of said molten metal product is higher than it would have been had only said unroasted sulfide material been fed to said autogenous smelting.

4,415,357

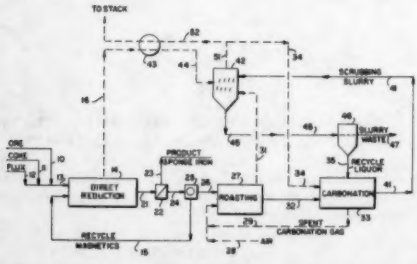
SOLID WASTE TREATMENT IN REDUCTION OF IRON ORE

William V. Bauer, New York, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jun. 14, 1982, Ser. No. 387,800

Int. Cl.³ C21B *13/08*

U.S. Cl. 75—29 **12 Claims**



1. In a process for reducing iron ore to iron in the presence of a carbonaceous reductant and flux wherein a solid mixture of carbonaceous reductant and spent flux containing calcium oxide and calcium sulfide is recovered from the reducing and subjected to roasting to reduce the sulfide content thereof, the improvement comprising:

carbonating as an aqueous slurry solids recovered from said roasting to further reduce the sulfide content and convert oxide to carbonate and thereby stabilize said solids.

4,415,358

METHOD OF DESULFURIZING A FERROUS MELT

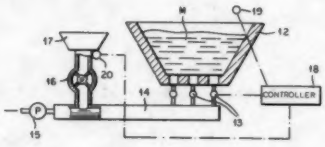
Paul Metz, Luxembourg; Francois Schleimer, Esch/Alzette; Edouard Legille, Luxembourg; Jean Goedert, Esch/Alzette, and Antoine Weiner, Luxembourg, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Apr. 23, 1982, Ser. No. 371,439

Claims priority, application Luxembourg, Apr. 24, 1981, 83314

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—58 **10 Claims**



1. A method of desulfurizing a deoxidized ferrous metal melt having a covering of slag, said method comprising the steps of:

containing said melt in a vessel having below the level of said melt a refractory gas-pervious wall portion provided with channels impenetrable by liquid metal of the melt;

removing the slag from said melt;

suspending finely divided desulfurizing treatment solids in a gas; and

introducing the suspension through said wall portion via said channels into said melt and reacting said melt with said solids after the removal of the slag.

4,415,359

MULTI-STEP STEELMAKING REFINING METHOD

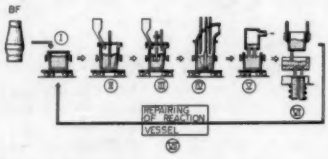
Mitsuhiko Nishimura, and Morikatsu Sakurada, both of Kamaishi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,615

Claims priority, application Japan, Mar. 30, 1981, 56/47023

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—60 **10 Claims**



1. A multi-step steelmaking refining method, comprising:

(a) tapping molten pig iron from a blast furnace into a reaction vessel;

(b) in said vessel, desiliconizing and dephosphorizing said molten pig iron;

(c) in said vessel, decarburizing the desiliconized and dephosphorized molten pig iron, by:

(i) soft top-blowing oxygen onto the upper surface of such molten pig iron through a plurality of apertures which are

so diversely aimed as to more widely disperse the oxygen impacting the surface of such molten pig iron, and to form a cavity of lesser depth therein, than would result from top-blowing the same amount of oxygen per unit time onto said surface through a single aperture; while

(ii) stirring such molten pig iron by blowing a stirring fluid thereinto from beneath said upper surface at a stirring rate, at least in an initial stage of this decarburizing step (c), of at least 400 watts per ton of such molten pig iron;

(d) sometime between conducting steps (a) and (e), desulfurizing said molten pig iron; and

(e) casting resulting molten steel from said vessel.

4,415,360

METHOD FOR WORKING-UP METAL-CONTAINING WASTE PRODUCTS

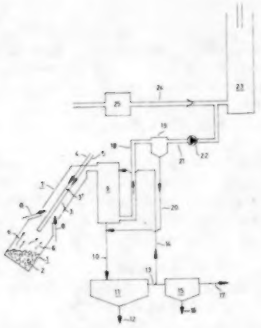
Johan S. Leirnes, Skelleftehamn, and Malkolm S. Lundström, Skellefteå, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Jul. 19, 1982, Ser. No. 399,841

Claims priority, application Sweden, Jul. 22, 1981, 8104490

Int. Cl.³ C22B *7/00*

U.S. Cl. 75—65 R **11 Claims**



1. A method for converting metal-containing waste products having a substantial organic content to a reacted product from which metal can be readily recovered, comprising the method steps of introducing the waste products to a reactor vessel having a closed bottom and a longitudinal axis and arranged for rotation about its longitudinal axis; intermittently unloading reacted product and subsequently loading a refill of said waste product through a common charge and discharge opening at a top end of the reactor vessel; maintaining the products at a controlled temperature range sufficiently high to maintain an expulsion process to expel organic constituents in the form of a combustible gas, said temperature being maintained while rotating the reactor vessel at a predetermined controlled speed with said axis inclined to the horizontal at an angle of less than 90° for as long as such a gas continues to be generated; continuously combusting the combustible gas at a location external of the reactor vessel; and unloading the reacted product from the reactor vessel in a molten and/or non-molten state.

4,415,361

IRON BASED ALLOY

Pantcho Tomas, Randwick, Australia, assignor to British Gas Corporation, London, England

Filed Oct. 22, 1982, Ser. No. 435,945

Claims priority, application United Kingdom, Nov. 2, 1981, 8132912

Int. Cl.³ C22C *38/06*

U.S. Cl. 75—124 **3 Claims**

1. An iron-based alloy consisting essentially of between 7 and 20% by weight niobium and between 5 and 10% by weight aluminium the balance being iron and incidental impurities.

4,415,362

NODULAR IRON MAKING AND/OR STORING

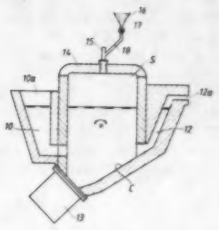
Ake Archenholtz, Västerås, Sweden, assignor to ASEA AB, Västerås, Sweden

Filed Dec. 9, 1982, Ser. No. 448,348

Claims priority, application Sweden, Dec. 15, 1981, 8107489

Int. Cl.³ C22C *33/08*

U.S. Cl. 75—130 B **3 Claims**



1. A furnace for making and/or storing a molten magnesium-containing nodular iron melt, said furnace comprising an enclosure adapted to be partially filled with a molten iron melt at a temperature above the vaporizing temperature of magnesium and to enclose a space above the melt so that the space is heated by the melt to a temperature above said vaporizing temperature, said space being adapted to confine a gas that is non-reactive with magnesium, controllable feeding means for feeding magnesium or magnesium-containing particles into said space without substantial escape of pressure from the space, and means responsive to pressure in said space for automatically controlling said feeding means so as to maintain said pressure at a predeterminable value by vaporization of said particles in said space, said furnace having heating means for adding heat to said melt while in said enclosure.

4,415,363

SINTERED IRON BASE FRICTION MATERIAL

Keith E. Sanftleben, and Walter R. Tarr, both of Troy, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 3, 1982, Ser. No. 374,225

Int. Cl.³ B22F *1/00*; C22C *33/02*; F16D *69/02*

U.S. Cl. 75—229 **10 Claims**

SINTERED FRICTION MATERIAL COMPOSITION

INGREDIENTS WEIGHT %	X	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
IRON	53	79	72	85	81	80	77	75	84	75	76	76	78	77	76	74	69	90
COPPER																		10
GRAPHITE	18	7	14	3	8	7	7	7	8	7	7	7	7	7	7	7	7	17
COKE		8	8	7	8	8	8	8	2	12	8	8	8	8	8	8	8	8
TIN		6	6	5	3	5	6	10	6	6	6	6	6	6	6	6	6	6
MOLY DISULFIDE											1	1	6					
FRICTION POWDER	3													1	2	3		
ZINC	10																5	10
BISMUTH	8																	
RESIN	12																	
$BaSO_4$	7																	

1. A sintered iron base friction material consisting of:

72–85% by weight of a base material selected from a group consisting of iron, and a mixture of iron and copper powders;

3–14% by weight of graphite;

2–12% by weight of coke;

0–3% by weight of friction modifiers; and

3–10% by weight of low melting material selected from a group consisting of zinc, bismuth, lead and tin, said low melting material alloying with said base material to de-

velop a matrix that holds said friction modifiers, graphite and coke in a substantially fixed relationship to produce said friction member, said friction member on engagement with a corresponding mating member generating thermal energy, said friction member having a substantially constant wear rate when the generated temperature is below 300° C. and a substantially linear wear rate above 300° C.

4,415,364

ONE-PACKAGE INORGANIC BINDER COMPOSITION

Hiroyuki Naito, Tokyo; Takashi Maruya, and Masaaki Sugawara, both of Tsuruoka, all of Japan, assignors to Mizusawa Industrial Chemicals Ltd., Osaka, Japan

Filed Jun. 24, 1982, Ser. No. 391,720
Claims priority, application Japan, Jun. 25, 1981, 56-97558
Int. Cl.³ C04B 19/04
U.S. Cl. 106—74 8 Claims

1. A one-package inorganic binder composition comprising a powdery mixture of a powdery alkali metal silicate having a water solubility or water dispersibility, an alkali metal borate soluble in an alkaline aqueous solution and silicon polyphosphate.

4,415,365

BARRIER FOR CONTAINING SPENT OIL SHALE

Byron G. Spars, Mill Valley, and Lawrence E. Santucci, San Anselmo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1981, Ser. No. 305,332
Int. Cl.³ C04B 7/30
U.S. Cl. 106—85 9 Claims

1. A composition for use in making a cementitious, substantially water impermeable barrier having a cured coefficient of permeability less than about 1×10^{-6} cm/sec., the composition being comprised of a mixture of:

(a) about 70% to about 90% by weight particulate combusted oil shale having

(i) a particle size of less than about one centimeter;

(ii) a residual organic carbon content of less than about 1% by weight; and

(iii) from about 20 to 35% by weight of its Mg, Ca, and Fe carbonate minerals content decomposed; and

(b) about 10% to about 30% by weight water.

4,415,366

LIGHTWEIGHT CEMENT SLURRY AND METHOD OF USE

Ward L. Copening, Parrish of Orleans, La., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 241,339, Mar. 6, 1981, abandoned. This application Sep. 21, 1982, Ser. No. 420,655
Int. Cl.³ C04B 15/02
U.S. Cl. 106—86 23 Claims

1. A foamed hydraulic cement slurry comprising an aqueous, thixotropic slurry of hydraulic cement in which is dispersed, as discrete stable bubbles, a gas or mixture of gases and which comprises calcium sulfate hemihydrate in an amount sufficient to impart thixotropic properties to said slurry.

4,415,367

PUMPABLE THIXOTROPIC CEMENT SLURRIES FOR USE IN CEMENTING PIPES IN A WELL

Erik B. Nelson, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 18, 1978, Ser. No. 943,583
Int. Cl.³ C04B 7/35
U.S. Cl. 106—89 10 Claims

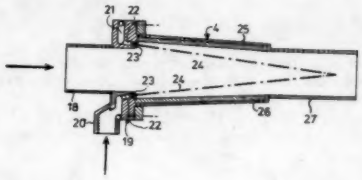
1. A pumpable, thixotropic hydraulic cement slurry comprising the reaction products obtained from combining (a) iron (II) sulfate, or hydrate thereof, (b) aluminum sulfate, or a hydrate thereof, (c) a hydraulic cement comprising calcium hydroxide or a hydrolyzable calcium oxide and (d) water.

4,415,368

METHOD OF PURIFYING SOIL POLLUTED BY OIL

Hendrik A. Kroon, Berg aan de Maas, Netherlands, assignor to H. A. Kroon B.V., Berg aan de Maas, Netherlands

Filed Jul. 30, 1981, Ser. No. 288,455
Claims priority, application Netherlands, Aug. 1, 1980, 8004420
Int. Cl.³ B08B 3/02, 7/04
U.S. Cl. 134—10 8 Claims



1. A method of purifying polluted soil containing hydrocarbon impurities, employing a jet pipe in a conduit, comprising forming a substantially conical water curtain in said jet pipe from water under high pressure moving at high velocity generally in a downstream direction in the jet pipe,

thereby generating subatmospheric pressure upstream of the water curtain,

sucking with said subatmospheric pressure a mixture of the polluted soil, air, and water into the jet pipe and through said water curtain in the downstream direction, and

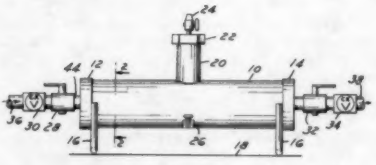
then conducting away the resulting mixture.

4,415,369

INJECTION TANK FOR CLEANING BOILERS AND HEAT EXCHANGERS

James M. Allmendinger, 9263 Panama Ave., Ypsilanti, Mich. 48197, and James O. Thornton, 20555 Lindley Rd., Chelsea, Mich. 48118

Filed Mar. 17, 1982, Ser. No. 359,112
Int. Cl.³ B08B 9/06
U.S. Cl. 134—22.12 6 Claims



1. A portable hand carriable hydraulic injection tank for cleaning boilers and heat exchangers comprising a generally cylindrical oblong tank with an inlet end and an outlet end enclosing each end of the cylindrical tank, an inlet valve and inlet check valve serially connected to the inlet end of the tank and adapted for connection to a pressurized water supply, an outlet valve and outlet check valve serially connected to the outlet end of the tank and adapted for connection to a boiler or heat exchanger, a capped fill pipe connected to the tank and a perforated baffle within the tank enclosing substantially the entire inlet end of the tank, said baffle perforated so as to cause a substantially evenly distributed flow of fluid throughout the tank interior as the fluid moves from inlet end to outlet end.

4. The method of cleaning a boiler or heat exchanger comprising:

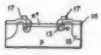
(a) adding a quantity of cleaning material to an hydraulic injection tank with the inlet and outlet valves of the tank closed,
(b) attaching a source of pressurized water to the inlet of the tank and attaching the outlet of the tank to the boiler or heat exchanger,
(c) admitting pressurized water to the tank through the inlet valve while simultaneously releasing air from the tank through an air relief stop cock,
(d) closing the air relief stop cock to pressurize the tank, and,
(e) opening the outlet valve to flush the water and cleaning material mixture into the boiler or heat exchanger.

4,415,370

METHOD OF BERYLLIUM IMPLANTATION IN GERMANIUM SUBSTRATE

Shuzo Kagawa, Kawasaki; Tatsunori Shirai, Yokohama; Takao Kaneda, and Yasuo Baba, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 15, 1980, Ser. No. 187,419
Int. Cl.³ H01L *21/263*
U.S. Cl. 148—1.5 **14 Claims**



1. A method of manufacturing a semiconductor device wherein said method comprises a step of implanting ions of beryllium into a germanium substrate to form a p-type layer in said substrate.

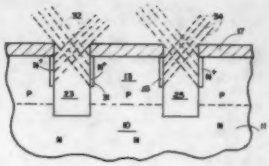
4,415,371

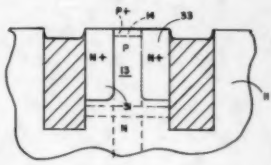
METHOD OF MAKING SUB-MICRON DIMENSIONED NPN LATERAL TRANSISTOR

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 29, 1980, Ser. No. 220,400
Int. Cl.³ H01L *21/22, 21/31*
U.S. Cl. 148—1.5 **6 Claims**

1. A method for forming an array of sub-micron dimensioned NPN lateral transistors on a substrate doped n-type, wherein each transistor is formed comprising the following steps:
implanting P-type impurities into the substrate for a given depth;
masking the substrate to outline boundary regions for each active region to comprise a transistor;
slotting the substrate in said boundary regions beyond said depth;
doping the substrate active regions via opposed inner sidewalls of a first pair of boundary slots at spaced apart three dimensional regions adjacent the respective inner sidewalls the slotted boundary regions to a depth less than said given depth to render said three dimensional regions above said depth N+ doped;
filling the doped slotted boundary regions with field oxide and driving in the doped three dimensional regions;
doping the upper portion of the active region of each transistor by implanting P+ type doping except for the N+ portions thereof; and,





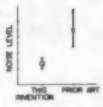
metallizing and patterning said substrate surface to provide electrical connections to each of said N+ regions and to said P+ region.

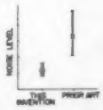
4,415,372

METHOD OF MAKING TRANSISTORS BY ION IMPLANTATIONS, ELECTRON BEAM IRRADIATION AND THERMAL ANNEALING

Yutaka Koshino; Toshio Yonezawa, both of Yokosuka; Takashi Ajima, Tokyo, and Jiro Ohshima, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 20, 1981, Ser. No. 313,332
Claims priority, application Japan, Oct. 24, 1980, 55-148357
Int. Cl.³ H01L *21/263*
U.S. Cl. 148—1.5 **5 Claims**



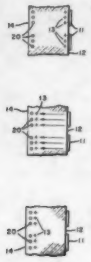


1. A method for fabricating a semiconductor device comprising the steps of:
ion-implanting an impurity into a monocrystalline semiconductor substrate;
irradiating a region into which said impurity ions have been implanted with an accelerated electron beam under the conditions that an acceleration voltage is 20 to 200 KeV, a current is 0.01 to 1 mA and an exposure dose is 10^{12} to $10^{15}/cm^2$; and
carrying out annealing to form a semiconductor region of one conductivity type.

4,415,373
LASER PROCESS FOR GETTERING DEFECTS IN SEMICONDUCTOR DEVICES

Robert J. Pressley, Cupertino, Calif., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 17, 1981, Ser. No. 322,123
Int. Cl.³ H01L *21/265;* B23K *27/00*
U.S. Cl. 148—1.5 **10 Claims**



1. A process for gettering defects in a semiconductor wafer comprising the steps of:

(a) providing a dopant material at a major surface of the wafer, that surface being opposite to a second surface of the wafer in which a semiconductor device is formed;

(b) generating a laser beam at a wavelength that is absorbed by the major surface;

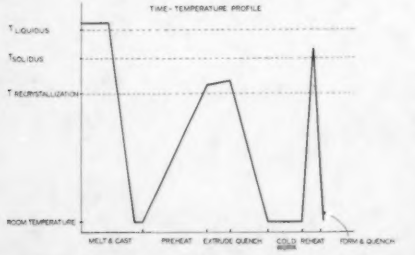
(c) directing the beam onto the major surface to melt the area of incidence and to diffuse the dopant into the wafer; and

(d) heating the wafer at a temperature and for a time sufficient to drive defects to traps formed by the dopant in the wafer.

4,415,374
FINE GRAINED METAL COMPOSITION

Kenneth P. Young, Ballwin; Curtis P. Kyonka, Maryland Heights, and James A. Courtois, Florissant, all of Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,622
Int. Cl.³ C22F *1/04, 1/08*
U.S. Cl. 148—2 **24 Claims**



1. A process for the preparation of a metal composition suitable for forming in a partially solid, partially liquid condition, said process comprising

producing a solid metal composition having an essentially directional grain structure,

heating said directional grain composition to a temperature above the solidus and below the liquidus to produce a partially solid, partially liquid mixture containing at least 0.05 volume fraction liquid, said composition prior to heating having a strain level introduced such that upon heating, the mixture comprises uniform discrete spheroidal particles contained within a matrix composition having a lower melting point than said particles,

solidifying said heated composition, said solidified composition having a uniform, fine grained microstructure comprising uniform discrete spheroidal particles contained within a lower melting matrix.

4,415,375
TRANSIENT TITANIUM ALLOYS

Richard J. Lederich, University City, and Shankar M. Sastry, St. Louis, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

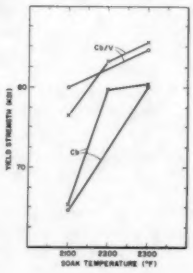
Filed Jun. 10, 1982, Ser. No. 387,153
Int. Cl.³ C22F *1/18*
U.S. Cl. 148—11.5 F **21 Claims**

1. The method of superplastically forming of titanium and titanium alloys comprising treating a stock piece of titanium or titanium alloy in a hydrogen containing atmosphere causing absorption of hydrogen into the matrix of the stock part in an amount effective to improve forming, and forming the treated stock in a die.

4,415,376
FORMABLE HIGH STRENGTH LOW ALLOY STEEL SHEET

Bruce L. Bramfitt; Steven S. Hansen, both of Bethlehem; Donald L. Harper, Easton, and Roger R. Pradhan, Nazareth, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 174,321, Aug. 1, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,097
Int. Cl.³ C21D *8/02;* C22C *38/12*
U.S. Cl. 148—12 F **6 Claims**



1. A hot-rolled high strength steel sheet having an essentially refined ferritic grain size and a balanced chemical composition in which the elements thereof contributing to the strength of the steel through grain refinement and precipitation hardening are limited in quantity to that which will go completely into solution at a temperature above 2100° F., said chemistry consisting essentially of, by weight, 0.06 to 0.09% carbon, 1.0 to 1.6% manganese, 0.5% maximum silicon, 0.03 to 0.05 columbium, 0.07 to 0.09% vanadium, 0.010 to 0.025% nitrogen, 0.004% maximum sulfur, 0.02% maximum phosphorus, 0.02 to 0.08% aluminum, the balance iron with residual impurities and incidental elements, where said steel sheet is characterized by the mechanical properties of a yield strength of at least 80 ksi, a transverse bendability of $1\overline{T}$ or less, and improved sheared edge stretchability as measured by hole expansion of at least 58%, and by a microstructure comprising fine grained ferrite containing VN precipitates of less than 5 nm.

4. A method of producing a high strength, hot-rolled steel sheet having a thickness in a range between about 0.07 to 0.25 inches, comprising the steps of (1) preparing a steel whose chemistry is balanced within the following limits, by weight,

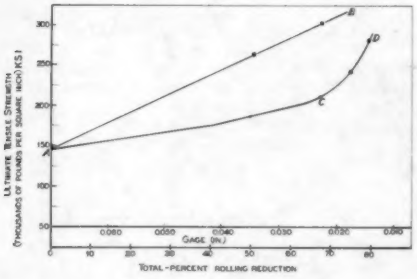
0.06 to 0.09% carbon, 1.0 to 1.6% manganese, 0.5% maximum silicon, 0.03 to 0.05% columbium, 0.07 to 0.09% vanadium, 0.010 to to 0.025% nitrogen, 0.004% maximum sulfur, 0.02% maximum phosphorus, 0.02 to 0.08% aluminum, the balance iron with residual impurities and incidental elements, (2) forming said steel into slab form having a thickness in a range between about 6 to 10 inches, (3) soaking said slab at a temperature between about 2100° to 2250° F., (4) reducing the thickness of said slab to final sheet thickness at a temperature above about 1550° F., (5) cooling the reduced sheet to a temperature between about 950° to 1200° F. and forming said sheet into a coil, whereby to produce a steel sheet characterized by the mechanical properties of a yield strength of at least 80 ksi, a transverse bendability of 1T or less, and improved sheared edge stretchability as measured by hole expansion of at least 58%, and by a microstructure comprising fine grained ferrite containing VN precipitates of less than 5 nm.

4,415,377

DUPLEX ROLLING PROCESS AND APPARATUS

Michael J. Pryor, Woodbridge, and William L. Brenneman, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 28, 1982, Ser. No. 392,908
Int. Cl.³ C21D 7/14
U.S. Cl. 148—12 R **14 Claims**



1. A process for working a metal or alloy subject to the formation of strain induced martensite comprising:

working said metal or alloy to reduce its thickness in a first stage of processing at a metal temperature at or above a first desired temperature at which the formation of said strain induced martensite is substantially suppressed or eliminated; and

working said metal or alloy following said first stage of processing in a second stage of processing to further reduce its thickness, said second stage working being carried out at or below a second desired temperature which is substantially lower than said first temperature and is selected such that the formation of strain induced martensite during said second stage working is promoted;

whereby said working can be carried out more efficiently.

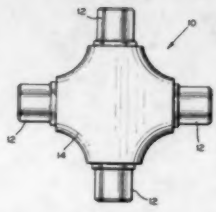
4,415,378

CASE HARDENING METHOD FOR STEEL PARTS

Joe R. McKinney, and Roy G. Swagger, both of Douglasville, Pa., assignors to Dana Corporation, Toledo, Ohio

Filed Apr. 22, 1982, Ser. No. 370,719
Int. Cl.³ C21A 1/00
U.S. Cl. 148—12.1 **13 Claims**

1. A method of forming a case hardened surface on a steel part made of a carburizing grade of steel, comprising the steps of: (a) completing all metal removal operations on said surface, including finish machining, (b) carburizing said surface to a surface carbon concentration in the range of 0.9 to 1.3%, (c) direct quenching said surface in oil by means resulting in retention of 10 to 30 percent austenite in said surface, (d) time tempering said surface in a controlled furnace environment at constant temperature, and (e) work hardening said surface to



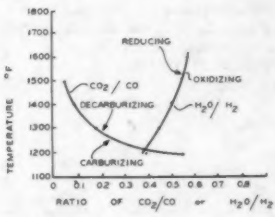
transform said retained austenite to at least 5 to 20 percent untempered martensite, and to induce compressive stresses into the case hardened surface.

4,415,379

HEAT TREATMENT PROCESSES

Mircea-Stefan Stanescu, Bridgewater, and William T. Fitzgerald, Whitehouse Station, both of N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Sep. 15, 1981, Ser. No. 302,336
Int. Cl.³ C21D 1/48
U.S. Cl. 148—16 **4 Claims**



1. A process for annealing ferrous material in a continuous furnace having charge and discharge vestibules and a hot zone therebetween and into which furnace inward leakage of ambient oxidants occurs, comprising the steps of:

heating said hot zone, which has a plurality of zones therein, to a temperature above 1250° F.;

introducing a mixture consisting essentially of some but not more than 10% methane, some but not more than 3% propane, balance nitrogen into one or more zones of said hot zone wherein said propane reacts with a portion of said oxidants to form relatively active methane which together with said introduced methane effectively precludes decarburization of said material;

introducing a mixture consisting essentially of nitrogen and methane into a further zone of said hot zone; and

introducing essentially only nitrogen into still further zones of said hot zone.

4,415,380

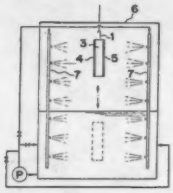
METHOD FOR MAKING A HIGH REMANENCE FE-MO-NI MAGNETIC ELEMENT

Sungho Jin, Gillette, and Thomas H. Tiefel, Rockaway, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 178,832, Aug. 18, 1980, Pat. No. 4,340,434. This application Apr. 1, 1982, Ser. No. 364,624
Int. Cl.³ H01F 1/02
U.S. Cl. 148—101 **4 Claims**

1. Method for making a magnetic element consisting of a

body of a metallic alloy having a magnetic squareness ratio which is greater than or equal to 0.9 and having remanent magnetic induction which is greater than or equal to 13000 gauss, said alloy comprising an amount of at least 99.5 weight percent Fe, Mo, and Ni, Mo being in the range of 2–26 weight percent of said amount and Ni being in the range of 0.5–15



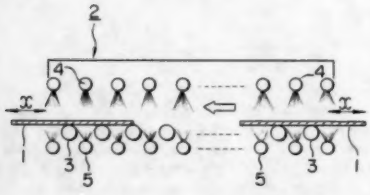
weight percent of said amount, said method comprising the steps of (1) annealing said body by heating at a temperature in a range of 900–1200 degrees C., (2) rapidly cooling the annealed body, (3) deforming the rapidly cooled body, and (4) aging the deformed body at a temperature in the range of 500–800 degrees C.

4,415,381

METHOD FOR FORCEDLY COOLING A HEATED METAL PLATE

Saburo Tani; Mitsuru Yamawaki; Yukifumi Ogawa, and Kenji Hirabe, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1981, Ser. No. 284,376
Claims priority, application Japan, Jul. 25, 1980, 55-101246
Int. Cl.³ C21D *9/46*
U.S. Cl. 148—153 **2 Claims**



1. In a method for forcedly cooling a heated metal plate uniformly in the longitudinal direction of the metal plate, which comprises:

moving a heated metal plate horizontally in the longitudinal direction thereof at a prescribed speed through a cooling apparatus comprising a plurality of rows of nozzles arranged at prescribed intervals in the width direction of said metal plate above and below said metal plate; and, spraying a cooling liquid from said nozzles onto the upper and the lower surfaces of said metal plate during moving of said metal plate through said cooling apparatus to cool said metal plate to a prescribed temperature;

the improvement comprising:

starting said spraying of said cooling liquid from said nozzles when a prescribed length of the trailing end portion of said metal plate during moving of said metal plate still remains outside of said cooling apparatus;

discontinuing said spraying of said cooling liquid from said nozzles when a given length of the leading end portion of said metal plate during moving of said metal plate projects outside of said cooling apparatus by an amount such that said given length equals said prescribed length;

said prescribed length of the trailing end portion of said metal plate being determined by the following equation:

$$x = S\tau_c(1-K)$$

where,

x: said prescribed length;

S: moving speed of said metal plate in said cooling apparatus;

τ_c: forced cooling period of time for the portion of said metal plate other than said trailing end portion of said metal plate which remains outside of said cooling apparatus by said prescribed length and said leading end portion of said metal plate which projects outside of said cooling apparatus by said given length which equals said prescribed length; and

K: constant dependent on the material and the size of said metal plate;

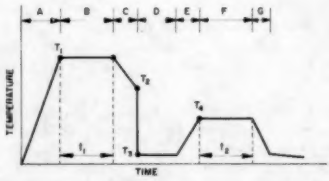
whereby said metal plate is cooled uniformly in the longitudinal direction thereof.

4,415,382

CONTINUOUS ANNEALING APPARATUS AND METHOD

Kenneth M. Gaskey, South Holland, Ill.; Indra Gupta, Munster, Ind., and Richard S. Cline, Crete, Ill., assignors to Inland Steel Company, Chicago, Ill.

Filed Oct. 13, 1981, Ser. No. 310,780
Int. Cl.³ C21D *1/00*
U.S. Cl. 148—153 **13 Claims**



1. In a continuous annealing apparatus for metal strip having a heating zone wherein the strip is heated to an elevated temperature, a soak zone wherein the heated strip is maintained at an elevated temperature, a water quench zone wherein the heated strip is quenched, and means for moving the strip successively through said zones;

the improvement wherein a pre-quench zone is interposed between said soak zone and said water quench zone, said pre-quench zone comprising:

an enclosure means;

means for directing the strip through said enclosure means in a plurality of passes;

gas jet cooling means disposed in said enclosure means along the path of movement of the strip and arranged to impinge cooling gas against opposite sides of the moving strip for effecting controlled cooling of the strip to a desired quench temperature; and

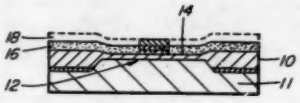
a plurality of gas-fired radiant tube heaters or electrical resistance heaters disposed in said enclosure means along the path of movement of the strip, said heaters being operable to retard the cooling rate of the strip below the natural cooling rate prevailing when said cooling means is not in use, without reducing the speed of the strip through said enclosure means.

4,415,383

METHOD OF FABRICATING SEMICONDUCTOR DEVICES USING LASER ANNEALING

Abdalla A. H. Naem, Ottawa; Iain D. Calder, Nepean, and Hussein M. Naguib, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 10, 1982, Ser. No. 376,687
Int. Cl.³ H01L 21/268, 21/28
U.S. Cl. 148—187 11 Claims



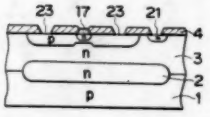
1. In a method of making silicon integrated circuits, the steps of depositing a layer of polysilicon on an insulating layer, covering a region of the polysilicon with an antireflective coating, directing laser radiation at the polysilicon layer to recrystallize only an area under the antireflective coating, and etching the polysilicon layer using etch conditions ensuring preferential etching of unrecrystallized polysilicon in comparison to recrystallized polysilicon.

4,415,384

METHOD FOR MANUFACTURING A SEMICONDUCTIVE DEVICE

Masayuki Hashimoto, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,325
Claims priority, application Japan, May 27, 1981, 56-79172
Int. Cl.³ H01L 21/223, 21/265
U.S. Cl. 148—187 6 Claims



1. A method for manufacturing a semiconductive device comprising:

exposing a part of the surface of a first conductive-type semiconductive substrate and providing the other part with a first film;

partially forming a second film on said exposed part of the surface of the first conductive-type semiconductive substrate;

doping second conductive-type impurities through said exposed part and said second film to thereby selectively form a second conductive-type semiconductive region within said first conductive-type semiconductive substrate; and

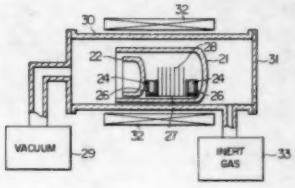
doping first conductive-type impurities through said second film to thereby selectively form a first conductive-type semiconductive region.

4,415,385

DIFFUSION OF IMPURITIES INTO SEMICONDUCTOR USING SEMI-CLOSED INNER DIFFUSION VESSEL

Osamu Saito; Hideo Homma, both of Hitachi; Hirokazu Inoue, Ibaraki, and Naohiro Momma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 291,042
Claims priority, application Japan, Aug. 15, 1980, 55-111653; Oct. 9, 1980, 55-140444
Int. Cl.³ H01L 21/223
U.S. Cl. 148—189 20 Claims



1. A method of diffusing impurities into a semiconductor body utilizing a diffusion system which comprises a semi-closed diffusion chamber including a diffusion vessel with an opening and a removable baffle member for partially blocking the opening of said vessel to form the semi-closed diffusion chamber having a limited opening, and an evacuatable enclosure having an openable end member for accommodating said diffusion chamber therein, the diffusion vessel being adapted to accommodate said semiconductor body and a diffusion source through said opening, and the semi-closed diffusion chamber being capable of exhausting the atmosphere inside the chamber by evacuating the outside, the method comprising the steps of:

loading the diffusion source and the semi-conductor body in said diffusion vessel through said opening;

disposing said baffle member at said opening to form the semi-closed diffusion chamber having the limited opening, wherein said limited opening has a conductance for the vapor molecules of diffusion impurity, which is equal to the conductance of an imaginary opening having an open area S_o and an infinitely thin thickness, based on the molecular flow condition, said diffusion source has a free surface area of S, and the value of S_o/S is not larger than about 1×10^{-1} at a diffusion temperature;

evacuating the inside of the enclosure which contains said semi-closed diffusion chamber, thereby also evacuating the inside of said diffusion chamber through said limited opening;

heating said semi-closed diffusion chamber to subject the diffusion chamber to a heat treatment at a temperature not lower than 450° C. at which substantial diffusion does not take place, while evacuating the inside of said enclosure, for desorbing and exhausting adsorbed molecules from said diffusion chamber, wherein said semi-closed diffusion chamber has a volume V, said limited opening has a conductance C for water molecules based on the molecular flow condition, and the value of V/C in said heat treatment is not larger than about two seconds;

further heating said semi-closed diffusion chamber to a diffusion temperature at which said diffusion source vaporizes and diffuses into said semiconductor body;

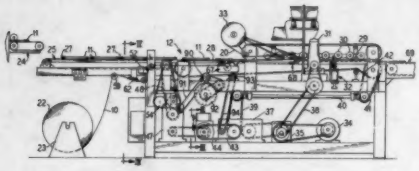
cooling the diffusion chamber; and

removing said baffle member and unloading the semiconductor body from the diffusion chamber.

4,415,386
METHOD AND APPARATUS FOR ASSEMBLING AND ATTACHING ZIPPER CLOSURE STRIPS TO SACKS

Robert A. Ferrell, Shelbyville, Ind., and James A. Robinette, Bristol, Tenn., assignors to KCL Corporation, Shelbyville, Ind. and Strong-Robinette Company, Inc., Bristol, Tenn.

Filed Feb. 12, 1982, Ser. No. 348,210
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—64 14 Claims



1. Apparatus adapted for assembling and attaching, in an attachment station thereof, zipper closure means in strip form to the open ends of folded flat sacks, and wherein consecutive sections of said closure means, each having a zipper slider and slider stop means, must be in proper registration with said sack ends in said attachment station and with said slider stop means generally aligned with the sides of said open ends, and comprising:

means for feeding said sections seriatim through said attachment station;

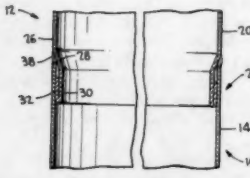
means for delivering said zipper closure means along a path and section-by-section into assembly with said open ends of said sacks in said attachment station;

and monitoring means located along said path for sensing said slider stop means and for detecting and automatically correcting deviations from said proper registration.

4,415,387
METHOD OF FORMING AN ANNULAR SEAM BETWEEN TWO CONTAINER BODY HALVES

Fred C. Newman, La Grange Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 215,602, Dec. 12, 1980, Pat. No. 4,372,459. This application Sep. 22, 1982, Ser. No. 421,189
Int. Cl.³ B23P *11/02*; B29C *27/00*
U.S. Cl. 156—69 2 Claims



1. A method of joining open ends of cup members to form a container, said method comprising the steps of radially displacing in a selected direction a terminal portion of an open end of one of said cup members and reversely folding a terminal part of said terminal portion in an opposite radial direction to define a hem of a radial dimension to receive in sliding telescoped engagement an open end portion of the other of said cup members and wherein an annular chamber is provided at a free end of said hem, filling said annular chamber generally to overflowing with an adhesive, telescoping open ends of said cup members with a free end of said other cup member engaging said adhesive and displacing a portion of said adhesive in a shearing action to trap part of said adhesive between said cup members axially adjacent said hem free end and in sealing engagement with said hem free end and to cover in sealing engagement the free end of said other cup member.

4,415,388
METHOD OF MAKING ABSORBENT BEARING PRODUCTS

Ralf Korpman, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 274,232, Jun. 22, 1981, which is a continuation-in-part of Ser. No. 248,387, Jun. 27, 1981, and Ser. No. 181,289, Aug. 25, 1980, abandoned. This application Aug. 5, 1981, Ser. No. 288,864
Int. Cl.³ B32B *31/30, 5/20*
U.S. Cl. 156—78 4 Claims

1. A process for producing an absorbent bearing foam product comprising:

(1) feeding into a cold extruder the components of a liquid foam-forming composition comprising a particulate water-insoluble, water-swellable absorbent polymer having a gel capacity of at least 10, a liquid polyhydroxy organic compound, and a blowing agent, wherein the amounts of the components are from about 25 to about 125 parts by weight of the absorbent polymer and from about 2 to about 30 parts by weight of blowing agent for every 100 parts by weight of liquid polyhydroxy organic compound;

(2) passing the components through an extruder barrel at ambient temperature to intimately mix the components;

(3) forcing the resulting mixture into a die maintained at temperatures in the range of about 200° to 400° F. to cause foam formation;

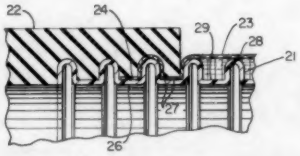
(4) expelling the foam through the orifice of the heated die onto a temporary or permanent substrate; and

(5) allowing the foam to solidify into an absorbent bearing solidified structure.

4,415,389
METHOD OF MAKING A HOSE CONSTRUCTION

Richard D. Medford, and Jerry W. Cooper, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed May 5, 1980, Ser. No. 146,556
Int. Cl.³ B32B *7/04*
U.S. Cl. 156—91 11 Claims



1. In a method of making a hose construction comprising the steps of forming a flexible corrugated hose of a polymeric material and having a plurality of outwardly convex projections with recesses therebetween and extending from one end thereof to the other end thereof, fixing a pair of hose connectors to opposite ends of said hose, and disposing a sleeve which has opposite end portions around said hose, the improvement comprising the step of fastening said sleeve to said projections of said hose only at its opposite end portions by sandwiching each opposite end portion between said hose and its respective hose connector so that each hose connector holds its respective end portion of said sleeve in sandwiched relation against at least one projection of said hose and against at least one recess of said hose that is adjacent to said one projection and with said sleeve making only substantially circular line contact with said projections between said end portions and being substantially taut between said end portions and substantially free of sags

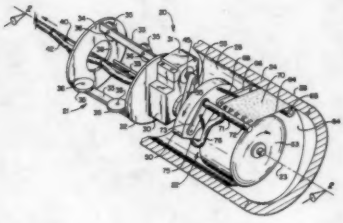
between said projections and over said recesses between said end portions whereby said sleeve serves to improve the fluid pressure resistance and external wear resistance of said hose while keeping its flexibility substantially intact.

4,415,390

INTERNAL WRAPPING METHOD AND APPARATUS

Robert B. Smith, Columbus, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Nov. 12, 1981, Ser. No. 320,228
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—187 **9 Claims**



1. A method of coating and sealing the interior wall of a stationary conduit comprising:

applying motive means positioned within the conduit to spirally unwind a sealing membrane from a roll within the conduit,

applying by motive means within the conduit, an adhesive material between the membrane and the inner circumferential wall of the conduit,

followed by pressing and adhering the membrane against the sealing material and against the interior circumferential wall of the conduit,

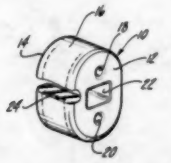
while moving the roll of the membrane longitudinally within the conduit by means attached to the motive means, actuated and controlled from a position external to the conduit.

4,415,391

REINFORCED MOLDED RUBBER MUFFLER HANGER AND METHOD OF MAKING OF SAME

Glenn J. Reid, 2270 Chestnut, Bloomfield Hills, Mich. 48084

Filed Apr. 6, 1982, Ser. No. 366,029
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—187 **7 Claims**



1. The method of manufacturing a load-bearing reinforced elastic article comprising the steps of:

preparing a preform of uncured elastic material approximating the shape of the finished article;

preparing a wrapping loop made up of a reinforcing material coated with said uncured elastic material; the loop size accurately conforming substantially to an exterior circumferential dimension of the finished article but being slightly greater than the same circumferential dimension of the preform;

the combined mass of the preform and loop accurately conforming to the mass of the finished article;

placing the loop on the preform so as to contact and circumscribe the said circumferential dimension; and

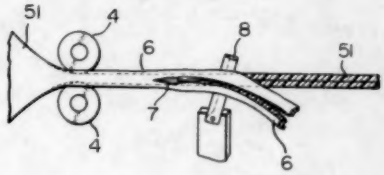
compression molding the combination of preform and loop to cure and physically unify same and to expand the circumferential dimension of the preform to fill the loop.

4,415,392

METHOD FOR PRODUCING FOAMED PLASTIC SHEET

Tetsuo Komori, Utsunomiya, Japan, assignor to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 94,888
Claims priority, application Japan, Nov. 20, 1978, 53-142311; Nov. 22, 1978, 53-143539
Int. Cl.³ B29D *23/04*; B32B *31/18*
U.S. Cl. 156—244.13 **5 Claims**



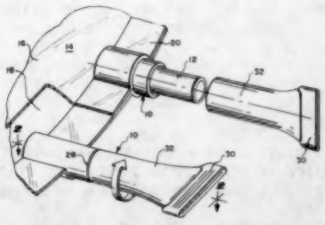
1. A method for producing a foamed plastic sheet which comprises heating and kneading a thermoplastic synthetic resin composition containing a blowing agent in an extruder, extruding the resulting product through a circular die to form a tubular member, compressing and flattening the foamed tubular extrudate while in the softened state to cause the inside walls thereof to self-adhere and form a sheet, the extent of said compressing, in terms of the width of said sheet, being at least 5% smaller than the width of said tubular member in the flattened state, thereby forming on the outer perimeters of said flattened and compressed sheet longitudinal and substantially tubular portions open to the atmosphere to vent resulting gases, and thereafter longitudinally cutting from the sheet thus formed said longitudinal, tubular portions to produce a continuous sheet of foamed plastic material.

4,415,393

METHOD OF MAKING A FRANGIBLE PORT PROTECTOR

Robert G. Grimes, Vernon Hills, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 22, 1981, Ser. No. 313,568
Int. Cl.³ B29D *23/04*; B32B *31/18*
U.S. Cl. 156—244.13 **5 Claims**



1. The method of manufacturing a tear-off port protector carried on a container which comprises placing extruded plastic tubing on a mandrel that fills the bore of said tubing and

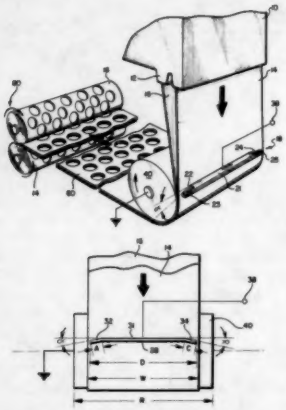
stretches the tubing; spacing a cutting blade a predetermined distance of less than the tubing wall thickness from the mandrel and rotating said mandrel and tubing carried thereon, causing the cutting blade to form an annular cut about the tubing while maintaining the predetermined distance; removing the tubing from the mandrel, closing one end of the tubing, and sealing the outside surface of the other end of the tubing to said container with an access port positioned in telescoping relation inside of said tubing, said tubing sealed to the access port through a spacer bushing positioned within said tubing, whereby tearing open of said tubing along the annular cut exposes the access port.

4,415,394

METHOD AND APPARATUS FOR UNIFORM CORONA DISCHARGE BONDING

Sidney Cholmar, Stamford, Conn., assignor to National Can Corporation, Chicago, Ill.

Filed Nov. 18, 1981, Ser. No. 322,514
Int. Cl.³ B32B *31/28;* B05D *3/14*
U.S. Cl. 156—379.8 **9 Claims**



1. An apparatus for bonding together two or more layers of material generally uniformly across their common width, said apparatus comprising a ground means adapted to be positioned across the width of said layers of material on one side of said layers of material to be bonded and an electrode means adapted to produce a corona discharge positioned on the opposite side of said material from said ground means, said electrode means being of a length to extend substantially across said common width for producing an effectively uniform corona energy field across said common width of said layers of material, said electrode means having end portions adapted to be subject to an increased corona field strength, said end portions being configured to substantially compensate for said increased corona field stength to produce a generally uniform corona field across said common width whereby said layers of material are substantially uniformly bonded across their common width.

4,415,395

APPARATUS FOR APPLYING A PRINTING OR CUTTING FORCE TO A LAMINATED TAPE

Michael W. Paque, Scottsdale, Ariz., assignor to Kroy Inc., St. Paul, Minn.

Filed Jan. 15, 1982, Ser. No. 339,482
Int. Cl.³ B30B *15/02, 15/04*
U.S. Cl. 156—384 **24 Claims**

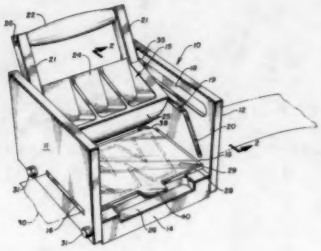
1. An apparatus for applying a printing or cutting force to an elongated strip of tape comprising:

a base;

means associated with said base including a generally flat printing or cutting surface for defining a printing or cutting station;

a pair of generally parallel side walls extending upwardly from said base, each of said side walls including a tape receiving opening in alignment with said printing or cutting station to define the path of travel of said elongated strip through said apparatus;

a printing or cutting member positionable in printing or cutting alignment with said printing or cutting station between said side walls; and



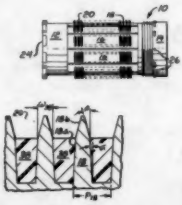
force exerting means for exerting a printing or cutting force on said printing or cutting member including a force exerting member disposed between said side walls and having a curved force exerting surface with its center of curvature lying on an axis generally parallel to the path of travel of said elongated strip through said apparatus and perpendicular to said side walls and support and guide means for supporting and guiding said curved force exerting surface in movement between a first postion and a second position with at least a portion of said movement being generally rolling and force exerting movement with respect to said printing station.

4,415,396

APPARATUS FOR MAKING FILAMENT REINFORCED PLASTIC SCREEN

Walter R. Wagner, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 334,105, Dec. 24, 1981, Pat. No. 4,381,820.
This application Sep. 27, 1982, Ser. No. 423,776
Int. Cl.³ B31C *3/00*
U.S. Cl. 156—425 **5 Claims**



1. In a screen winding apparatus of the collapsible, plural segment, helically finned mandrel type used for forming a strand of resin-coated reinforcing filaments into a helically wound screen surface defining wire, the improvement comprising providing fins on the mandrel segments which are formed so that the major portion of the radial length of their sides, when viewed in an axial plane of the mandrel, starting at their base, is tapered in an outwardly converging direction at a

relatively small angle and the remaining minor portion of their radial length is tapered at a relatively larger angle, said minor portion being adapted to be engaged along lesser or greater portions of its radial extent by lesser or greater thicknesses of resin coated reinforcing filaments, depending upon the width of screen slot desired between adjacent helically wound screen wires formed between adjacent fins on the mandrel, whereby said major portion of the fin radial length will produce a relatively narrow width, slightly tapered support base portion on said screen wires while said minor portion of the fin radial length will produce a substantially wider wear surface.

4,415,397

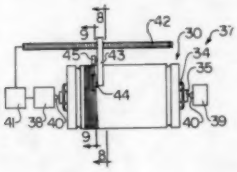
APPARATUS FOR MAKING TOOTHED BELT

Robert E. Wetzel, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 110,032, Jan. 7, 1980, abandoned, which is a division of Ser. No. 217,261, Dec. 16, 1980, Pat. No. 4,343,666, which is a division of Ser. No. 957,280, Nov. 2, 1978, Pat. No. 4,235,119. This application May 17, 1982, Ser. No. 378,978

Int. Cl.³ B29H *7/22*

U.S. Cl. 156—446 **5 Claims**



1. An apparatus for making positive drive transmission belts having a plurality of alternating grooves and elastomeric teeth comprising:

frame means;

means for rotatably and detachably mounting a cylindrical belt building mold thereon, said mold having a plurality of axially extending spaced grooves in its outer circumference;

means for rotating said mold;

cord winding means including a laydown arm means having a cord laydown wheel means mounted thereon and means for moving said arm means in a direction parallel to the rotational axis of said mold;

heating means for heating the belt components assembled on said mold; and

forcing wheel means carried by said arm means for forcing the heated belt components into said grooves in said mold in advance of said cord laydown wheel means.

4,415,398

CUSHIONING DUNNAGE APPARATUS

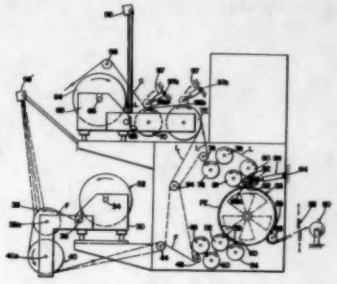
Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Division of Ser. No. 75,662, Sep. 14, 1979, Pat. No. 4,314,865. This application Sep. 30, 1981, Ser. No. 307,008

Int. Cl.³ B31F *1/00*; B32B *31/08*

U.S. Cl. 156—470 **16 Claims**

1. In an apparatus for producing the cell cushioning dunnage from flexible thermoplastic sheet stock, each sheet of which comprises a composite of an intermediate stratum of high density high melting point thermoplastic material generally impervious to the passage of air therethrough, and exterior stratums formed of low density, low melting point thermoplastic material, with said intermediate stratum being of a higher density, higher melting point material as compared to that of the exterior stratums, comprising a rotatable forming drum having a plurality of recesses formed therein for vacuum forming the air cells in a first sheet of the thermoplastic material fed onto the drum, said drum including means for cooling the drum to a predetermined temperature, and a series of spaced rollers spaced with respect to said forming drum, said series of rollers having means providing for heating the first sheet prior to its being fed onto said drum, to a temperature above the melting point of the exterior stratums of the first sheet but below the melting point temperature of the intermediate stratum, and a second series of rollers spaced from said first series and having means adapted to heat a second sheet of the thermoplastic stock material to a temperature above the melting point of the exterior stratums of the second sheet but below the



melting point of the intermediate stratum of the second sheet, and means coacting with said second series for applying the second sheet to the first sheet on said drum during rotation of the latter to seal the air cells, with said first series and said second series of rollers and said applying means being so arranged with respect to the circumference of said drum that said applying means is spaced from the point of application of the first sheet to the drum sufficiently that said drum during rotation thereof can cool the first sheet to a temperature approaching the softening point temperature of the exterior stratum of the first sheet prior to application of the second sheet thereto.

4,415,399

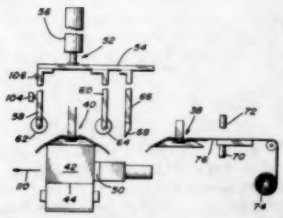
HANDLE APPLICATOR

Wolfgang Geisinger, 352 Rosemere Blvd., Rosemere, Quebec, Canada J7A 2T5

Filed May 19, 1982, Ser. No. 380,017

Int. Cl.³ B32B *1/00*

U.S. Cl. 156—475 **6 Claims**



1. A handle applicator comprising; a first and a second gripping means, means to reciprocate each of said gripping means to alternately move each said gripping means to and from a pick-up station and an application station, each of said gripping means including an anvil member and a clamping member adapted to cooperate with said anvil member and hold a handle on said anvil member, means to deliver articles to said application station and means to apply a handle supported by one of said anvil members in said application station to said

article, means to move articles with handles applied thereto from each application station.

4,415,400

DEVICE FOR JOINING TWO SINGLE ADHESIVE TAPES TO FORM A DOUBLE ADHESIVE TAPE

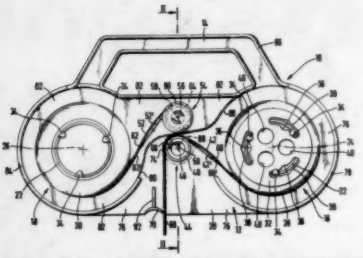
Paul Rammelmeyr, Friedhofstr. 12, 8352 Grafenau, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,854

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111748

Int. Cl.³ B32B *51/00*

U.S. Cl. 156—555 **12 Claims**



1. A device for joining two adhesive tapes each having one adhesive side into a centrally overlapping double adhesive tape with the adhesive sides on either side of the overlapping area facing in opposite directions comprising:

two supports for each rotatably mounting one supply roll of rolled-up single adhesive tape around a rotary core;

a frame mounting and connecting the rotary cores with their axes displaced from one another in mutually corresponding radial planes and having a handle portion; and

means located between said supports for joining said tape including first and second adhesive tape control cylindrical rolls, one of the single adhesive tapes being unrolled from one supply roll around one of said rolls, and then steered into position about the other of said rolls with its adhesive side in contact with the adhesive side of the other single adhesive tape in such a way that a double adhesive tape is formed which is partially adhesive on both sides, and drawn out with a glued together overlap area through an area bounded by stops on either side, the cylindrical surface of said other roll extending beyond a tangential contact line at which said tape is drawn from said other roll so that said tape can be pulled off said cylindrical surface in a direction which can be varied between said stops.

4,415,401

CONTROL OF ATMOSPHERE SURROUNDING CRYSTAL GROWTH ZONE

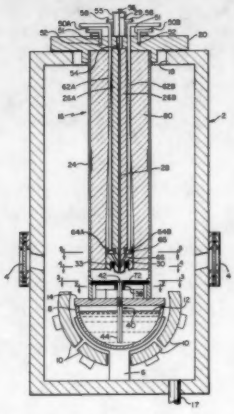
Fritz Wald, Wayland, and Juris P. Kalejs, Wellesley, both of Mass., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 129,075, Mar. 10, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 216,300

Int. Cl.³ C30B *15/34*

U.S. Cl. 156—608 **24 Claims**

1. In a method of growing a crystallized body of silicon from a silicon melt where a stationary graphite shaping member is used in the growth zone and the liquid/solid growth interface is characterized by a meniscus between the shaping member and the growing body, the improvement comprising continuously enveloping the growth zone with a moving mixture of an inert gas and a carbon-containing gas, said carbon-containing gas constituting a relatively small proportion of said mixture so



as to beneficially affect the electronic quality of the grown silicon body.

4,415,402

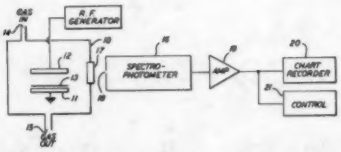
END-POINT DETECTION IN PLASMA ETCHING OR PHOSPHOSILICATE GLASS

Barry Gelernt, Bridgeport, and C. Wallace Wang, Wilton, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 2, 1981, Ser. No. 250,375

Int. Cl.³ H01L *21/306*; C03C *15/00*

U.S. Cl. 156—626 **3 Claims**



1. A method for detecting end-point in the plasma etching of a phosphorous doped silicon dioxide layer coated on a substrate of single crystal silicon comprising the steps of;

etching the phosphorous doped silicon dioxide from the substrate within an etching chamber with gas from the fluorinated hydrocarbon family,

spectroscopically observing the gases in the etching chamber over a time interval covering the beginning and end of the etching process and within a predetermined wavelength interval,

observing the presence of the phosphorous atomic line straddled by two argon atomic lines at the beginning of the etching process,

observing the disappearance of said phosphorous atomic line from between said two argon atomic lines as an indication of the end of the etching process.

4,415,403

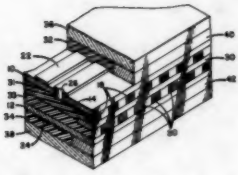
METHOD OF FABRICATING AN ELECTROSTATIC PRINT HEAD

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 962,193, Nov. 20, 1978, abandoned. This application Dec. 8, 1980, Ser. No. 214,463

Int. Cl.³ C23F *1/02*; B44C *1/22*; G01D *15/06*

U.S. Cl. 156—634 10 Claims



1. The method of fabricating an electrostatic print head comprising the steps of:

etching holes through a glass or ceramic substrate at predetermined positions;

vacuum depositing a first metal layer on both surfaces of the substrate and onto the surfaces of the holes previously etched through the substrate to produce a uniform conductive layer intimately adhered directly to the substrate and having the same smooth surface characteristics as the substrate surface;

electroplating a second metal layer on the surfaces of the first metal layer to produce a planar structure of uniform composition and thickness;

forming a photoresist pattern on one surface of the second metal layer defining a high resolution array of electrode lines extending along a first direction, with the ends of the electrode lines lying along an edge of the substrate and defining a high resolution array of writing styli, and a pad area on each electrode line surrounding a respective one of the holes through the substrate;

forming a photoresist pattern on the opposite surface of the second metal layer to define a high resolution array of buss lines extending along a transverse direction to the first direction, with a connector area on each of the buss lines and a pad area on each of the buss lines in registration with a pad area of a respective electrode line and surrounding a respective hole through the substrate;

plating a third metal layer on all exposed surfaces of said second metal layer defined by the photoresist patterns to produce a multilayered metal structure of uniform thickness and conductivity;

plating the styli of the electrode lines to intended precisely configured cross-sectional shape and size;

removing the photoresist material from both surfaces of the substrate; and

selectively etching the exposed first and second metal layers to leave the third metal electrode line and buss line patterns on respective substrate surfaces, the electrode lines and buss lines having high resolution and uniform composition without breaks or cracks.

4,415,404

PROCESS OF ETCHING GLASS SURFACES, PARTICULARLY IN THE MANUFACTURE OF OPTICAL WAVEGUIDES

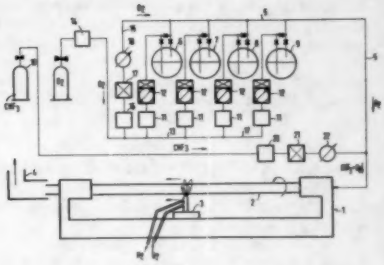
Ivan Riegl, Grafenau, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,587

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3000954

Int. Cl.³ C03C *15/00*

U.S. Cl. 156—635 11 Claims



1. A process of treating surfaces of silica glass or silicate glass, particularly in the course of preparing an internal surface of a tubular substrate for subsequent coating during the manufacture of optical waveguides, comprising the steps of introducing to the surface to be treated a gaseous medium containing at least one component from which hydrogen fluoride is formed when the temperature of the gaseous medium exceeds a predetermined level; raising the temperature of an etching zone extending only over a portion of the surface to at least the predetermined level to form hydrogen fluoride in the gaseous medium and have the same etch the surface only at the etching zone; and effecting relative movement between the etching zone and the surface until all portions of the latter have been etched.

4,415,405

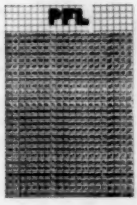
METHOD FOR ENGRAVING A GRID PATTERN ON MICROSCOPE SLIDES AND SLIPS

Frank H. Ruddle, New Haven, and Pin-Fang Lin, Branford, both of Conn., assignors to Yale University, New Haven, Conn.

Filed Aug. 19, 1981, Ser. No. 294,153

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—645 12 Claims



1. A method for engraving a closely-spaced grid pattern onto a glass microscope slide or cover slip, which comprises:

applying a positive photoresist to a glass surface of the slide or slip to produce a substantially uniform, dry, positive photoresist coating thereon;

baking the coated slide at a temperature of from about 50° C.

to about 150° C. for about 10 to 120 minutes, to produce a slide with a baked coating;

exposing the baked coating to light transmitted through a photographic transparency of the grid pattern to produce a photochemical reaction in the exposed portions of the coating;

removing the exposed portion of the coating with positive photoresist developer to produce a coated slide with a replicated image of the grid pattern in the coating;

rebaking the coated slide with the grid pattern image in the coating at a temperature of from about 50° C. to about 150° C. for about 10 to 120 minutes to produce a rebaked slide;

etching the portions of the glass surface of the slide which are exposed by the grid pattern in the coating thereon, with aqueous hydrofluoric acid, aqueous ammonium fluoride or a mixture thereof, to form an engraved grid pattern in the glass; and

removing the remaining coating from the glass slide.

4,415,406

CHEMICAL ETCHING OF POLYMERS FOR METALLIZING

Wayne T. Wiggins, Aurora, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Mar. 7, 1980, Ser. No. 128,327

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.³ B29C *17/08*

U.S. Cl. 156—668 **14 Claims**

1. A method for preparing the surface of a nitrile containing polymer article for metallizing comprising etching said surface with a mixture of (a) an acid having a pH at 0.1 N of less than 2, and (b) a monocarboxylic or halogenated monocarboxylic acid in the absence of chromic acid or precursor thereof.

4,415,407

DOWNFLOW EVAPORATOR

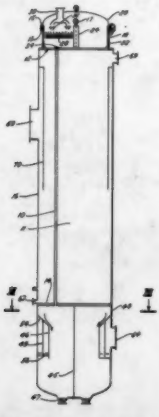
Andre Longuet, Bethune, France, assignor to Fives-Cail Babcock, Paris, France

Continuation-in-part of Ser. No. 203,048, Nov. 3, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,993

Claims priority, application France, Nov. 23, 1979, 79 28881

Int. Cl.³ B01D *1/10, 1/22, 1/30*

U.S. Cl. 159—13 A **15 Claims**



1. An evaporator for concentrating a descending stream of liquid containing solids, which comprises

(a) a bundle of downflow tubes having open upper and lower ends, the tubes being arranged in rows to receive the stream of liquid through the upper ends and to discharge it through the lower ends,

(b) an upper tube sheet holding the upper ends of the tubes,

(c) a lower tube sheet holding the lower ends of the tubes,

(d) means including several strata of elongated horizontal members spaced from each other above the upper tube sheet for causing the liquid to cascade over the entire surface of the upper tube sheet whereby the liquid is distributed thereover and over the open upper ends of the downflow tubes,

(1) each horizontal member of each stratum being disposed above a respective one of the rows of downflow tubes, the members of each stratum being parallel to each other and the angular orientation of the horizontal members of each stratum differing from that of the members of the other strata and

(e) a covering placed over the upper end of each downflow tube and spaced therefrom so as to prevent the liquid from dripping into the central portion of the tube whereby the stream of liquid descends peripherally along the inner surface of the tube.

4,415,408

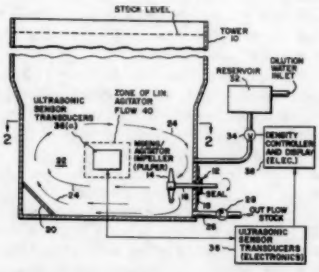
APPARATUS, AND METHOD FOR CONTROLLING CONSISTENCY

David N. Greey, Toronto, Canada, assignor to General Signal Corporation, Rochester, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,354

Int. Cl.³ D21F *1/08*

U.S. Cl. 162—198 **16 Claims**



1. Apparatus for controlling the consistency of a slurry containedin a tank which comprises an agitator for producing a flow of said slurry in said tank, liquid velocity sensor means for sensing said flow, said sensor being located adjacent to a surface of the tank at a region where said slurry flow is linear, means for providng an output corresponding to the sensed flow, and means responsive to said output for varying the dilution of said slurry to control the consistency thereof.

15. The method for measurement of consistency of a slurry in a tank which comprises the steps of agitating said slurry with an impeller to produce a circulating flow of said slurry in a said tank, then detecting the velocity at which said slurry flows adjacent to a surface of the tank at a region where said flow is linear, and deriving a measurement of consistency from said velocity.

4,415,409

PROCESS FOR THE SEPARATION OF HIGH BOILING OXYGENATED COMPOUNDS FROM MIXTURES WITH PHENOL AND/OR CRESOL

David Zadkevitch, Denville, and Stephen E. Belsky, Morris Plains, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 22, 1983, Ser. No. 468,242
Int. Cl.³ B01D *3/40;* **C07C** *37/80*
U.S. Cl. 203—51 **11 Claims**

1. A process for the separation of a mixture comprised of a first component consisting of at least one member selected from the group consisting of phenol and cresol and a second component having a boiling point of at least about 175° C. consisting of at least one member selected from the group consisting of alkanols, alkanones, cycloalkanones, cycloalkanols, aryl alcohols and aryl ketones; wherein said process comprises distilling said mixture in the presence of at least one extractive solvent selected from the group consisting of substituted phenols and cresols having 6 to 25 carbon atoms and a boiling point between about 195° C. and about 400° C. to produce a vapor overhead stream consisting essentially of said first component and a liquid bottoms stream consisting essentially of said second component and said extractive solvent; wherein said mixture may not be separated by simple fractional distillation procedures; wherein said extractive solvent has a boiling point at least about 20° C. above the boiling point of said second component.

4,415,410

FORMING OF TETRABASIC LEAD SULFATE BATTERY ELECTRODES

Gregory N. Reich, Norristown, Pa., assignor to Allied Corporation, Morristown, N.J.

Filed Feb. 28, 1983, Ser. No. 470,346
Int. Cl.³ H01M *10/12, 10/44*
U.S. Cl. 204—2.1 **7 Claims**

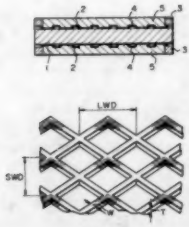
1. A process for the fabrication of lead acid batteries including a container for containing negative electrodes and positive electrodes, including the step of coating at least one said electrode with a paste containing tetrabasic lead sulfate, lead dioxide and water, curing said plates, placing said plates and an acid electrolyte in said container, and forming said plates in said container.

4,415,411

ANODE COATED WITH β-LEAD DIOXIDE AND METHOD OF PRODUCING SAME

Hideo Kanai; Akihiro Shinagawa, both of Maebashi; Takahiro Yamazaki, Shibukawa, and Reiichi Itai, Maebashi, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,908
Claims priority, application Japan, Mar. 4, 1980, 55-26182
Int. Cl.³ C25B *11/16*
U.S. Cl. 204—29 **13 Claims**



1. An anode coated with β-lead dioxide which comprises:
(a) a titanium substrate having opposed sides;
(b) titanium expanded metal which is laid on and fits closely to at least one of said opposed sides of said titanium substrate and is at least partially welded thereto, said titanium expanded metal having the following dimensions: an LWD in the range of from about 0.5 mm to about 5 mm, an SWD in the range of from about 0.5 mm to about 2.5 mm, a strand width in the range of from about 0.1 mm to about 1 mm, and a titanium thickness in the range of from about 0.05 mm to about 0.6 mm;
(c) titanium reinforcing bars which are set on the peripheries of said titanium expanded metal and are at least partially welded to both said titanium expanded metal and said titanium substrate;
(d) at least one intermediate layer on said titanium substrate and said titanium expanded metal, said intermediate layer being selected from the group consisting of an alloy and an oxide of platinum group metals; and
(e) a β-lead dioxide coating layer on said intermediate layer.

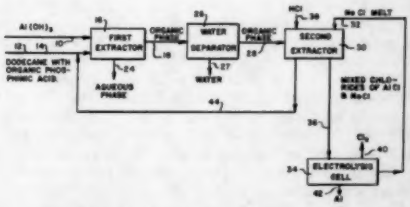
7. A method for the production of the anode set forth in claim 1 which comprises the following steps:
(a) roughening the surface of at least one side of a titanium substrate having opposed sides;
(b) placing and welding titanium expanded metal onto said titanium substrate;
(c) setting and welding titanium reinforcing bars onto both said titanium expanded metal and said titanium substrate to form an anode structure;
(d) washing said structure with an organic solvent, and degreasing by immersing in alkali metal hydroxide solution for 3 hours;
(e) immersing said structure in a hydrofluoric acid solution;
(f) covering the surface of said structure with a true solution which upon heating will form an alloy or an oxide of platinum group metals;
(g) heating said structure in an oven at a temperature of from about 450° to about 600° C. to deposit said alloy or said oxide on said structure and form an intermediate layer coating said reinforcing bars, said expanded metal and the surface of the substrate to which they are attached; and
(h) electrodepositing β-lead dioxide on said intermediate layer from a lead nitrate bath.

4,415,412

PRODUCTION OF ANHYDROUS ALUMINUM CHLORIDE COMPOSITION AND PROCESS FOR ELECTROLYSIS THEREOF

George F. Vandegrift, Bolingbrook; Michael Krumpelt, Naperville, and E. Philip Horwitz, Hinsdale, all of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 8, 1981, Ser. No. 309,655
Int. Cl.³ C25C *3/06;* **C01F** *7/58, 7/60*
U.S. Cl. 204—67 **14 Claims**



1. A process for producing an anhydrous aluminum chloride composition from an aluminous material in an aqueous phase comprising the steps of:
mixing in a first stage the material and an organic liquid substantially immiscible in water and containing an acidic extractant capable of extracting the aluminum from the

aqueous phase to form a dehydrated aluminum composition in the organic liquid, the mixing step forming an organic phase containing the organic liquid and the dehydrated aluminum composition;

removing the organic phase from the aqueous phase; and

mixing in a subsequent stage the organic phase and at least one alkali metal chloride at an elevated temperature and in amounts sufficient to convert the dehydrated aluminum composition in the organic phase in anhydrous aluminum chloride in a mixture with the alkali metal chloride, the temperature being sufficient to form the mixture of chlorides as a melt.

3. The process of claim 1 which includes the steps of:

feeding the mixture of alkali metal and aluminum chlorides to an electrolysis cell containing a bath composed of at least one alkali metal chloride and aluminum chloride;

operating the cell to form metallic aluminum from the aluminum chloride; and

recycling a portion of the bath to the second mixing stage as a source of the alkali metal chloride for extraction of additional aluminum chloride.

4,415,413

METHOD OF CONCENTRATING ALKALI METAL HYDROXIDE IN A CASCADE OF HYBRID CELLS

Andre Veber, Orge, France, assignor to Occidental Research Corporation, Irvine, Calif.

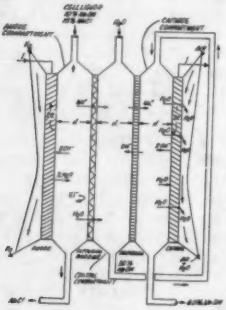
PCT No. PCT/US81/00446, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/03035, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 7, 1981, Ser. No. 310,903

Claims priority, application France, Apr. 22, 1980, 80 09040

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—98 **16 Claims**



1. A process for the production of alkali metal hydroxide and electrical energy by operating a plurality of three compartment hybrid cells in series, the plurality including a first hybrid cell at one end of the series and a last hybrid cell at the opposite end of the series, each hybrid cell comprising a gas diffusion anode having first and second surfaces, a diffusion barrier selectively permeable to cations and having first and second surfaces, a diaphragm permeable to both anions and cations and having first and second surfaces, and a gas diffusion cathode having first and second surfaces, the first surface of the anode and the first surface of the diffusion barrier defining an anode compartment, the second surface of the diffusion barrier and the first surface of the diaphragm defining a central compartment, and the first surface of the cathode and the second surface of the diaphragm defining a cathode compartment, the process comprising;

(a) introducing flow of an aqueous solution of at least one alkali metal hydroxide as anolyte to the anode compartment of said first hybrid cell at one end of the series;

(b) introducing flow of an aqueous fluid medium receptive to alkali metal ions as catholyte to the central compartment of said last hybrid cell at the opposite end of the series;

(c) causing the anolyte to flow through the anode compartment in sequence from the first hybrid cell to the last hybrid cell of the series;

(d) causing the catholyte to flow from the central compartment to the cathode compartment in each hybrid cell;

(e) causing the catholyte to flow from the cathode compartment of one hybrid cell to the central compartment of another hybrid cell in sequence from the last hybrid cell to the first hybrid cell of the series, the flow of catholyte in each central compartment being cocurrent with the flow of anolyte in the same hybrid cell and the flow of catholyte in the cathode compartment being countercurrent with respect to anolyte flow in the same hybrid cell;

(f) causing, in each cell by a flow of current through an external load between the cathode and the anode, which current is generated by oxidation of hydrogen supplied to the second surface of the gas diffusion anode and generation of hydroxide ions by reduction of an oxygen-containing gas supplied to the second surface of the gas diffusion cathode, alkali metal ions to selectively pass from the anolyte through the diffusion barriers to the catholyte to form with cathode generated hydroxide ions an aqueous solution of alkali metal hydroxide;

(g) withdrawing catholyte, which is more concentrated in respect to alkali metal hydroxide than the aqueous fluid medium introduced to the central compartment of the last hybrid cell of the series, from the cathode compartment of the first hybrid cell of the series; and

(h) withdrawing anolyte, which is more depleted in respect to alkali metal hydroxide than the aqueous solution introduced to the anode compartment of the first hybrid cell of the series, from the anode compartment of the last hybrid cell of the series.

4,415,414

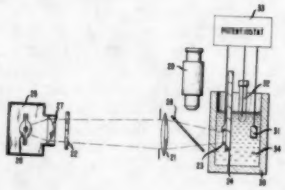
ETCHING OF OPTICAL SURFACES

Randolph H. Burton, Somerset; Paul A. Kohl, and Frederick W. Ostermayer, Jr., both of Chatham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 10, 1982, Ser. No. 416,473

Int. Cl.³ C25F *3/12, 3/14*

U.S. Cl. 204—129.3 **19 Claims**



1. A process for fabricating a device comprising at least one intrinsic or n-type compound semiconductor comprising the step of etching at least part of the compound semiconductor to produce a compound semiconductor surface of optical quality characterized in that the etching procedure is an electrochemical photoetching procedure in which electric current is passed through the compound semiconductor, electrolytic solution with conductivity greater than 0.0001 mhos/cm and cathode in which the electrochemical photoetching procedure further comprises

a. applying a potential to the semiconducting compound which is between the maximum potential of the valence band of the semiconductor compound in the electrolytic solution and the minimum potential of the conduction band of the semiconductor compound in the electrolytic solution;

b. illuminating the part of the surface of the compound

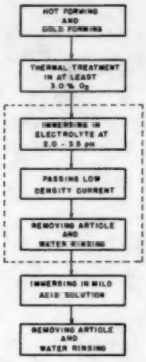
semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band; and,

c. the electrolytic solution comprises aqueous hydrofluoric acid.

4,415,415
METHOD OF CONTROLLING OXIDE SCALE FORMATION AND DESCALING THEREOF FROM METAL ARTICLES

Donald R. Zaremski, Cheswick, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1982, Ser. No. 444,128
Int. Cl.³ C25F *1/04, 1/06*
U.S. Cl. 204—141.5 **17 Claims**


HOT FORMING AND COLD FORMING
THERMAL TREATMENT IN AT LEAST 3.0 % O2
IMMERSING IN ELECTROLYTE AT 2.0 - 3.5 pH
PASSING LOW DENSITY CURRENT
REMOVING ARTICLE AND WATER RINSING
IMMERSING IN MILD ACID SOLUTION
REMOVING ARTICLE AND WATER RINSING

1. A process for the manufacture of a metal article comprising hot forming, cold forming and subsequently thermally treating in an oxidizing atmosphere, the process further comprising:

providing an oxygen content of the atmosphere of at least 3.0%, by volume, to control the oxide scale formed on the metal article;

immersing the article in an electrolyte of an aqueous solution of at least one neutral salt from the group consisting of the chloride, sulfate and nitrate of an alkali metal or ammonium, the pH of the electrolyte being adjusted and maintained from about 2.0 to 3.5;

passing a low density electric current through the article in the electrolyte to condition the scale for removal; and

removing the article from the electrolyte.

4,415,416
ELECTROCHEMICAL DEPYROPHORIZATION OF RANEY NICKEL ELECTRODES

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 30, 1982, Ser. No. 373,470
Int. Cl.³ C23F *13/00*; C25B *11/00*
U.S. Cl. 204—147 **9 Claims**

1. In an electrolytic method for depyrophoricizing a Raney nickel alloy electrode material, characterized by installing said electrode as an anode in an electrolytic cell and operating said cell to reduce the anodic polarization voltage so that it will not self-ignite, the improvement which comprises preparing as said electrode a monolithic Beta structured Raney nickel alloy structure having a Raney nickel alloy catalytic surface integral with a nickel alloy substrate containing from about 5 to about 20 percent by weight of an alloying metal selected from the group consisting of molybdenum, ruthenium, tantalum, titanium or mixtures thereof, and operating said cell at a current density of between about 10 and about 100 mA/cm^2 until the nominal negative anodic polarization voltage of said electrode is reduced by about 500 to about 700 mV below the nominal open circuit voltage for said cell.

4,415,417
PHOTOPOLYMERIZATION USING COPPER IONS

Lee W. Bush, Chesterfield, Mo.; Marie S. Chan, Pittsburgh, Pa.; Gary P. Craun, Bridgeville, Pa.; William J. Erlanson, Pittsburgh, Pa.; Wood E. Hunter, Pittsburgh, Pa., and Wallace B. Ramsey, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 263,444, May 14, 1981, abandoned. This application Jul. 19, 1982, Ser. No. 399,578
Int. Cl.³ C08F *2/50*
U.S. Cl. 204—159.24 **7 Claims**

1. In the method of polymerization for preparing polymers and copolymers of ethylenically unsaturated monomers which includes the passage of visible light through a reaction mixture containing at least one monomer, a photoreducible dye and a reducing agent at a sufficient intensity and for sufficient time to accomplish polymerization;

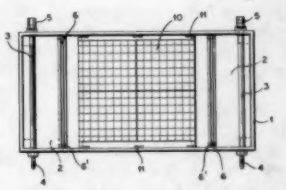
the improvement comprising:

adding copper ions to the solution in the concentration range of 10 to 1,000 parts per billion, thereby obtaining a product weight average molecular weight in the range of from 5 million to 15 million and obtaining a monomer conversion above 47.9 percent.

4,415,418
GEL ELECTROPHORESIS DEVICE AND METHOD

Gilles H. J. Turre, Paris; Michel Hours, Chateaufort, and Jacques R. Labrude, Palaiseau, all of France

Filed Dec. 21, 1981, Ser. No. 332,817
Claims priority, application France, Dec. 22, 1980, 80 27637
Int. Cl.³ G01N *27/26, 27/28*
U.S. Cl. 204—180 G **7 Claims**



1. An apparatus for effecting migration of a substance in a gel medium by horizontal gel electrophoresis which comprises:

an upwardly open tray formed with a support surface for said gel medium;

a pair of electrodes fixed in said tray on opposite sides of said support surface; and

a pair of removable partitions received in said tray between said electodes and said support surfaces whereby said medium, originally confined by said partitions, directly contacts an electrolyte in which each of said electrodes is immersed upon removal of said partitions, said support surface being formed as a platform in said tray between wells for said electrolyte and receiving said electrodes, said support being provided with a grid visible through said gel medium and inset from opposite walls of said tray whereby migration distances can be readily read from said grid, said electrodes being formed at least along their surface in contact with said electrode of a nonoxidizable nonprecious metal, each of said electrodes having an end passing through one of said walls and formed with a male plug for electrical connection, the other end of each electrode passing through the opposite wall of said tray and being formed with a female jack adapted to receive a corresponding plug of another similar tray whereby said trays can be assembled in side-by-side relationship and electrically connected.

4,415,419
PROCESS FOR PRODUCING A CORROSION-RESISTANT SOLID LUBRICANT COATING

Paul Niederhaeuser; Michel Maillat, both of Neuchatel, and Hans E. Hintermann, Ins, all of Switzerland, assignors to Laboratoire Suisse de Recherches Horlogeres, Neuchatel, Switzerland

Filed Jun. 30, 1982, Ser. No. 393,708
Claims priority, application Switzerland, Jun. 30, 1981, 4311/81; Oct. 12, 1981, 6509/81
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 C **19 Claims**

1. A method of producing a corrosion-resistant solid lubricant coating on a corrosion-resistant surface consisting of a sulfide-forming metal, said method comprising subjecting the surface to an electric plasma in an atmosphere containing hydrogen sulfide so as to form a sulfide adhering to said surface and exposing the sulfided surface to simultaneous cathodic sputtering of at least one solid lubricant selected from the group consisting of the chalcogen compounds of layer structure and at least one hydrophobic solid polymer, so as to form a composite coating in which the particles of the chalcogen compound are protected by the hydrophobic polymer, the atmospheres in which the sulfiding and the depositing of the coating take place being devoid of free or combined oxygen.

4,415,420
CUBIC BORON NITRIDE PREPARATION

Harry A. Beale, Columbus, Ohio, assignor to Applied Coatings International, Inc., Columbus, Ohio

Filed Feb. 7, 1983, Ser. No. 464,304
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 N **8 Claims**

1. A method for depositing cubic boron nitride on a substrate, comprising the steps of:

(a) heating a supported substrate in a vacuum;

(b) supplying metal vapors into a zone between said substrate and a metals source, said source comprising a material selected from the group consisting of:

boron,

boron and a material selected from the group consisting of the elements chromium, nickel, cobalt, and manganese,

and a metal alloy consisting essentially of from 0.1 weight percent to 5.0 weight percent of at least one of the elements chromium, nickel, cobalt, and manganese, the balance being boron;

(c) introducing ammonia gas into said zone; and

(d) generating an electrical field in said zone ionizing the metal vapors and gas atoms in the zone;

whereby cubic boron nitride is deposited on the surface of said substrate.

4,415,421
PROCESS FOR MANUFACTURING ORNAMENTAL PARTS AND ION PLATING APPARATUS TO BE USED THEREFOR

Yasutomo Sasanuma, Kawagoe, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,458
Claims priority, application Japan, Mar. 5, 1982, 57-33944
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 N **15 Claims**

1. A process for manufacturing an ornamental part comprising:

providing the ornamental part as a work to be treated, an electron beam melting vapor source for evaporating a titanium based metal, and one or more sputtering vapor sources for supplying at least a gold based metal vapor, within a vacuum chamber filled with a low-pressure gas atmosphere including a nitride gas;

establishing an electric field between said ornamental part and said electron beam melting vapor source to produce a plasma glow discharge therebetween;

evaporating and ionizing said titanium based metal in the plasma glow discharge to coat a film mainly composed of titanium nitride on a surface of said ornamental part;

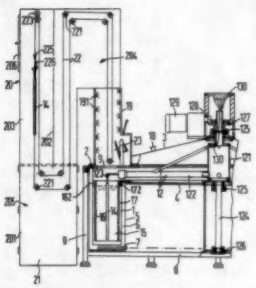
at the final stage of this process, applying a negative voltage to one or more targets of said one or more sputtering vapor sources and at the same time, supplying a gold based metal vapor to form a transition layer including both titanium nitride and gold; and

while continuing supplying the gold based metal vapor, stopping gradually the evaporation of said titanium based metal to coat a film of the gold based metal as a topcoat layer.

4,415,422
APPARATUS FOR ELECTRO-DEPOSITING ALUMINUM

Siegried Birkle, Aisch; Johann Gehring, Spardorf, and Klaus Stöger, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,942
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3102021
Int. Cl.³ C25D *17/02, 17/06, 17/28;* C25C *3/00*
U.S. Cl. 204—199 **8 Claims**



1. In a galvanizing apparatus for the galvanic precipitation of aluminum from an anhydrous, aprotic, and oxygen-free aluminum-organic electrolyte, said apparatus having an annularly shaped electrolyte trough for receiving an electrolyte, said trough having a plurality of anode plates arranged around a vertical axis of the trough and having cover means including cover segments for sealing the electrolyte in the trough from the atmosphere and for enabling charging of the trough with a protective gas to form a protective atmosphere, a rotatable contacting and holding device having a vertical rotational axis, said device being mounted for rotation in said trough with the rotational axis being on the vertical axis of the trough, the device having a plurality of support arms radiating outwardly from the rotational axis with goods carriers being able to be selectively attached to the support arms for passage around and through the electrolyte trough, a charging lock and a discharging lock, both of said locks being attached to the electrolyte trough and each including a preliminary chamber, a main chamber, a U-shaped fluid lock connecting said preliminary chamber to the main chamber and forming a gaseous seal, and an endless chain conveyor attached to and running continuously through the preliminary chamber, the main chamber and the fluid lock the improvement comprising a transport rod being attached to each anode plate and receivable by said support arms, and a lifting and displacement device being selectively attachable to one of the cover segments of the electrolyte trough and having a portion which is selectively engageable with an anode plate, so that while maintaining the protective atmosphere, an anode plate may be changed and replaced by being lifted by the lifting and displacement device from a place of suspension in the trough and placed on the support arm to be carried to the discharging lock for removal

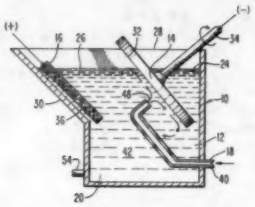
from the trough and a different plate is conveyed through the chambers of the charging lock placed in the support arm for movement in the trough to the lifting and displacement device for insertion in the place of suspension.

4,415,423

ELECTROFORMING APPARATUS FOR USE IN MATRIXING OF RECORD MOLDING PARTS

William C. Brooks, Brownsburg, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,241
Int. Cl.³ C25D *1/10, 21/10*
U.S. Cl. 204—212 **4 Claims**



1. An electroforming apparatus comprising in combination: a tank, a cathode, an anode, and means for circulating electrolyte; said tank having an electroforming section, a sump section and a weir separating said sections, said electroforming section able to hold a supply of electrolyte sufficient to permit the electroforming of said parts, said weir being positioned across an edge wall of the electroforming section so as to permit an overflow of electrolyte from the electroforming section into the sump section during the process of electroforming; said cathode including a revolvable disc shaped cathode head having means for securing a part to be replicated in position on the face of the cathode so that a replica can be electroformed on the part, said cathode head being positionable in the electroforming tank so as to at least be partially submerged in the electrolyte when the electroforming section is filled with an electrolyte, said cathode head being revolvable in a plane which is substantially normal to the overflow direction of the weir; said anode being positioned in said electroforming section in an opposing relationship to the cathode; said means for circulating electrolyte including inlet means for introducing electrolyte adjacent to the cathode head so as to induce a flow of electrolyte across the surface of a part mounted on the cathode head which is to be replicated and said circulating means further including means for removing electrolyte from the sump section and filtering and recirculating the electrolyte to said inlet means.

4,415,424

DEVICE FOR SUPPLY AND DISCHARGE OF LIQUID ELECTROLYTE FOR AN ELECTROLYZER OF FILTERPRESS TYPE

Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed Dec. 28, 1981, Ser. No. 334,601
Claims priority, application France, Jan. 16, 1981, 81 01102
Int. Cl.³ C25B *9/00, 15/08*
U.S. Cl. 204—257 **8 Claims**

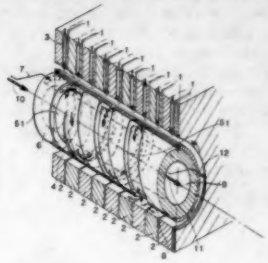
1. A device for supply and discharge of electrolyte for an electrolyzer of filterpress type, including, for one and the same set of cells placed side by side:

(a) at least one electrolyte inlet circuit common to the said set, from which leave channels feeding separately each anodic compartment and each cathodic compartment;

(b) an anolyte outlet circuit common to the said set, at which terminate channels connected separately to each anodic compartment;

(c) a catholyte outlet circuit common to the said set, at which terminate channels connected separately to each cathodic compartment;

(d) one of said circuits comprising at least one tranquilization chamber (4) in which terminate all of said channels (3) associated with said circuit, said tranquilization chamber being of small cross-section and being connected to the general electrolyte inlet or outlet by a duct (51) exhibiting



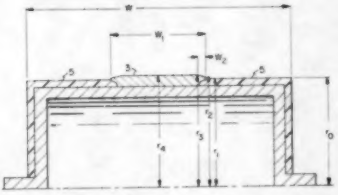
at least one portion of narrow shape twisted so as to confer upon said portion of said duct a great length and a small cross-section, and created in the body of a cylinder (6) bounding the inside of said tranquilization chamber.

4,415,425

CONDUCTOR ROLL CONTOUR

Charles A. Schacht, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 15, 1982, Ser. No. 358,078
Int. Cl.³ C01B *21/30*; C25D *17/00*
U.S. Cl. 204—279 **6 Claims**



1. In a cylindrically-shaped conductor roll for the electro-treating of one face of metal strip while masking the other face thereof from the electro-treating solution, said roll comprised of:

(i) a generally cylindrical core, the outer circumferential surface of which is encircled by,

(ii) a contact member in the form of

(a) a metallic ring disposed approximately midway along the wdith of said cylindrical core and

(b) metallic angular flange portions integrally joined to said ring along both edges thereof, said flange portions overlying a portion of

(iii) elastomeric sealing members encircling the remaining portion of the outer circumferential surface of the core,

wherein the radii of the outer circumferential surfaces of said roll, at different points along the width thereof, are defined as:

r_0 . . . the radius at the edge

r_1 . . . the radius of the sealing member at a line substantially perpendicular to the roll outer circumferential surface adjacent the flange portion edge furthermost from the mid-width of the ring,

r_2 . . . the radius of the flange portion at said adjacency line,

r_3 . . . the radius where the flange portion is integrally joined to said contact ring, and

r_4 . . . the radius at the mid-width of the ring,

the improvement wherein undesirable creases in the metal strip being treated are eliminated by utilizing an offset

such that $r_2 \cong r_1$ at the ambient temperature under which such contour is provided to the roll, said ambient temperature being substantially below the 100° to 180° F. operating temperature range under which electro-treating will be accomplished, such offset being sufficient to compensate for the greater differential expansion of the elastomer over that occurring in said metal contact ring at said operating temperature, and

said flange portion being provided with a taper, $r_3 > r_2$ at said ambient temperature, sufficient to compensate for the displacement of the flange caused by the expansion of the elastomer at said operating temperature, whereby $r_3 \simeq r_2 \simeq r_1$ when the roll surface reaches a steady-state condition within said operating temperature range.

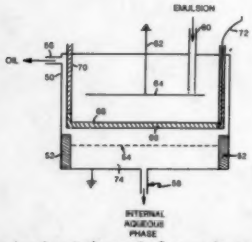
4,415,426
ELECTRODES FOR ELECTRICAL COALESCENSE OF LIQUID EMULSIONS

Edward C. Hsu, Bridgewater; Norman N. Li, Edison, and Taras Hucal, Iselin, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 192,560, Sep. 30, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 286,875

Int. Cl.³ C25B *11/00*; C10G *33/02*

U.S. Cl. 204—290 R **5 Claims**



4. An insulated electrode for use in coalescing water-in-oil emulsions comprising an electrically conductive material insulated with a solid dielectric having both a dielectric constant of at least about 4 and a hydrophobic surface.

4,415,427
THIN FILM DEPOSITION BY SPUTTERING

Henry T. Hidler, Danvers; Lawrence L. Hope, Stow, and Ernest A. Davey, Peabody, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 431,957

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **9 Claims**

1. A sputtering cathode apparatus for deposition of a doped thin film on a substrate which is moved relative to said apparatus, comprising;

planar magnetron sputtering means including means defining a frame-shaped plasma area and having a host target material disposed in the magnetron plasma area,

diode sputtering means disposed inside said framed area and out of the plasma sputtering area and comprising a dopant material,

and means for electrically exciting said host target material and dopant material to provide co-deposition of said materials therby forming the doped thin film on the substrate.

4,415,428
SUPPORT FOR ELECTROPHORESIS AND METHOD OF PRODUCING SAME

Samuel Nochumson, Rockland, and Henry J. Witt, Rockport, both of Me., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jan. 27, 1982, Ser. No. 342,993

Int. Cl.³ B01K *5/00*

U.S. Cl. 204—299 R **16 Claims**

1. A support for an electrophoretic medium comprising a base plate of an organoplastic sheet film and an adherent resin coating applied to at least one side of said base plate, said resin coating containing ethylenically unsaturated groups capable of undergoing copolymerization with acrylamide.

4,415,429
PROCESS FOR THE PREPARATION OF HIGHLY AROMATIC PITCHLIKE HYDROCARBONS

Jürgen Stadelhofer, Dortmund; Heinz-Gerhard Franck, Bad Soden-Neuenhain, and Helmut Köhler, Mülheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1980, Ser. No. 171,203

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935039

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—8 LE **7 Claims**

1. In a process for the production of a highly aromatic pitchlike hydrocarbon by disintegration of comminuted coal or similar carbon-containing raw materials with hydrocarbon mixtures as solvents with the use of elevated temperatures and pressure conditions, the improvement comprising decomposing said coal or other carbonaceous raw materials in an amount of 10–50% of the reaction components with 10–50% aromatized residues from steam cracking of petroleum fractions in combination with 10–50% of a complementary solvent with is an aromatic mixture originating from coal with middle boiling point above 350° C.

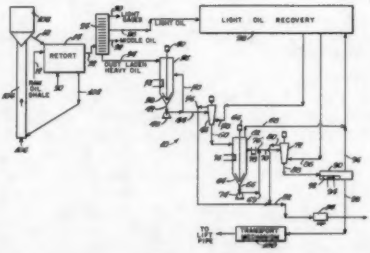
4,415,430
TWO-STAGE CENTRIFUGAL DEDUSTING PROCESS

Earl D. York, Engelwood, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 21, 1981, Ser. No. 285,454

Int. Cl.³ C10G *1/00, 31/10*

U.S. Cl. 208—8 R **36 Claims**



1. A process for dedusting particulate laden heavy oil derived from solid hydrocarbon-containing material, comprising the steps of:

introducing solid hydrocarbon-containing material into a retort;

introducing solid heat carrier material into said retort;

retorting said solid hydrocarbon-containing material by contacting said solid hydrocarbon-containing material with said solid heat carrier material at a retorting temperature to liberate a mixture of hydrocarbons and entrained particulates of dust ranging in size from less than one

micron to 1000 microns derived from said solid hydrocarbon-containing material;

separating a heavy oil fraction laden with said particulates of dust from said mixture;

heating said heavy oil fraction laden with said particulates of dust to a viscosity of less than 5 centistokes;

feeding said heated fraction to a first centrifuge;

centrifuging said heated fraction in said first centrifuge into a dedusted first stream of normally liquid heavy oil containing less than 1% by weight of said particulates and a first particulate laden residual stream containing a substantially higher concentration of said particulates then said oil fraction;

injecting light oil derived from said solid hydrocarbon-containing material into said first centrifuge to enhance removal of said first particulate laden residual stream from said first centrifuge;

feeding said first particulate laden residual stream injected with said light oil at a viscosity of less than 5 centistokes to a second centrifuge;

centrifuging said first particulate laden residual stream injected with said light oil in said second centrifuge into a dedusted second stream of normally liquid oil including light oil containing less than 1% by weight of said particulates and a second particulate laden residual stream containing a substantially higher concentration of said particulates than said first particulate laden residual stream;

heating said second particulate laden residual stream to vaporize said light oil and form a third particulate dust laden residual stream containing a higher concentration of said particulates than said second particulate dust laden residual stream;

feeding said third particulate dust laden stream to a lift pipe;

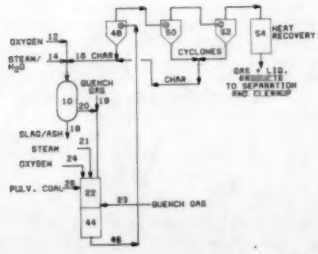
injecting air into said lift pipe to combust heavy oil contained in said third particulate dust laden stream and fluidize, entrain and propel said third particulate laden residual stream to a separation bin; and

conveying said combusted third particulate laden residual stream to said retort to provide at least a portion of said solid heat carrier material.

4,415,431
INTEGRATED OXYGASIFICATION AND HYDROPYROLYSIS PROCESS FOR PRODUCING LIQUID AND GASEOUS HYDROCARBONS

Richard S. Matyas, Broken Arrow, and John A. Hamshar, Owasso, both of Okla., assignors to Cities Service Company, Tulsa, Okla.

Filed Jul. 14, 1982, Ser. No. 397,956
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 R **10 Claims**



1. A two-stage process for producing liquid and gaseous hydrocarbons from carbonaceous materials, comprising:

(a) reacting oxygen and steam with partially gasified carbonaceous char in a first-stage gasification zone to obtain products which primarily include oxides of carbon, hydrogen, and water;

(b) separating the first-stage gaseous products from solid residue:

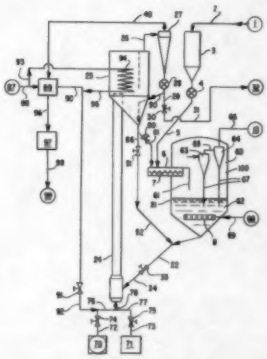
(c) reacting the hot first-stage gaseous products, as the primary heat source and heat transfer medium, with carbonaceous material in a second stage hydropyrolysis zone at a temperature from about 1000° F. to about 3500° F. and a pressure from about 250 psia to about 5000 psia; and

(d) rapidly cooling the second-stage reaction and products such that the total high temperature exposure time of said products is from about 2 milliseconds to about 2 seconds, to produce gaseous and liquid hydrocarbons.

4,415,432
HYDROCARBON RECOVERY METHOD AND APPARATUS

Earl D. York, Englewood, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1980, Ser. No. 208,165
Int. Cl.³ C10G *1/00*; C10B *49/10*
U.S. Cl. 208—11 R **3 Claims**



1. An improved method for recovering hydrocarbons from tar sands, oil shale and oil containing diatomaceous earth, comprising the steps of:

partially retorting raw, solid hydrocarbon-containing material selected from the group consisting of tar sands, oil shale and oil containing diatomaceous earth, in a retort defining a contacting zone by contacting said raw, solid hydrocarbon-containing material in said contacting zone with a heat transfer medium consisting essentially of spent solid hydrocarbon-containing material selected from the group consisting essentially of spent tar sands, spent oil shale and spent oil containing diatomaceous earth, at a sufficient temperature to liberate hydrocarbons comprising light hydrocarbon gases and oil selected from the group consisting of tar sands oil, shale oil, and oil derived from oil containing diatomaceous earth, from said raw, solid hydrocarbon-containing material;

passing said partially retorted, solid hydrocarbon-containing material, said spent hydrocarbon-containing material, and said liberated hydrocarbons from said retort to a container defining a separation zone;

substantially completing retorting of said partially retorted solid hydrocarbon-containing material in said separation zone;

substantially separating said liberated hydrocarbons from said solid material in said separation zone, including passing said liberated hydrocarbons through at least one cyclone located within said separation zone;

passing said solid material from said separation zone to a combustor including a lift pipe defining a combustion zone at a location spaced substantially away from said retort;

substantially combusting said solid material in said lift pipe at

said location spaced away from said retort to form said sent material;

withdrawing said liberated hydrocarbons from said separation zone; and

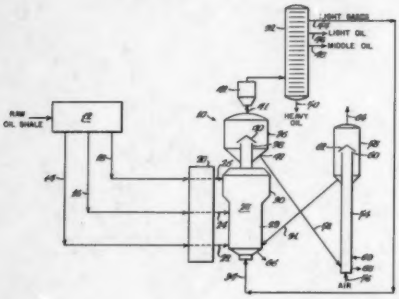
feeding a preheated oxygen-containing gas injected with 25 mol% to 50 mol% steam into said combustion zone to enhance combustion of said solid material.

4,415,433

FLUID BED RETORTING PROCESS WITH MULTIPLE FEED LINES

Gerald B. Hoekstra, deceased, late of South Holland, Ill. (by Edith Hoekstra, legal representative), assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1981, Ser. No. 322,943
Int. Cl.³ C10G *1/00*; C10B *49/10, 53/06*
U.S. Cl. 208—11 R **14 Claims**



1. A process for retorting solid hydrocarbon-containing material, comprising the steps of:

feeding a first stream of raw hydrocarbon-containing particles selected from the group consisting of oil shale, tar sands, coal, lignite, peat and uintaite, into a lower portion of a fluid bed retort;

feeding solid heat carrier material consisting of spent hydrocarbon-containing particles derived from said first stream into said lower portion of said fluid bed retort;

injecting a lift gas containing less than a sufficient amount of molecular oxygen to support combustion, into said lower portion of said fluid bed retort to fluidize, mix and transport said first stream and said spent hydrocarbon-containing particles substantially upwardly through an upper portion of said fluid bed retort into an overhead solids-containing collection vessel positioned substantially vertically above said fluid bed retort;

moving said first stream and said solid heat carrier material downwardly in said overhead vessel under the influence of gravity into a lower portion of said overhead vessel;

feeding a second stream of said raw hydrocarbon-containing particles into said upper portion of said fluid bed retort, said raw hydrocarbon-containing particles in said second stream being larger than said raw hydrocarbon-containing particles in said first stream;

moving said second stream downwardly in said fluid bed retort under the influence of gravity through and in countercurrent flow relationship to said first stream, into said lower portion of said fluid bed retort;

liberating oil and light hydrocarbon gases from said raw hydrocarbon-containing particles in said first and second streams in said fluid bed retort by heating said first and second streams to a retorting temperature in said fluid-bed retort with said solid heat carrier material;

substantially completing retorting of said first stream in said overhead vessel above said retort to liberate more oil and light hydrocarbon gases by heating said first stream at a retorting temperature with said solid heat carrier material in said overhead vessel;

withdrawing said second stream from the lower portion of said retort;

conveying said first stream and said solid heat carrier material by gravity flow from the lower portion of said overhead vessel to a combustor; and

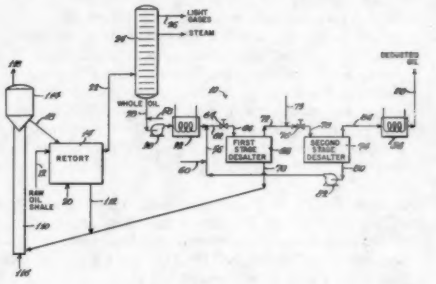
combusting said first stream with said solid heat carrier material in said combustor.

4,415,434

MULTIPLE STAGE DESALTING AND DEDUSTING PROCESS

Jay T. Hargreaves, Bolingbrook, Ill., and Albert L. Hensley, Munster, Ind., assignors to Standard Oil Company (Ind.), Chicago, Ill.

Filed Jul. 21, 1981, Ser. No. 285,601
Int. Cl.³ C10G *1/00, 31/08*
U.S. Cl. 208—11 R **50 Claims**



1. A process for producing and dedusting oil from solid hydrocarbon-containing material, comprising the steps of:

feeding solid hydrocarbon-containing material to a retort;

feeding solid heat carrier material to said retort;

retorting said solid hydrocarbon-containing material by mixing said solid hydrocarbon-containing material with said solid heat carrier material in said retort at a sufficient retorting temperature to liberate an effluent product stream of hydrocarbons and entrained particulates of dust derived from said solid hydrocarbon-containing material;

separating a fraction of normally liquid oil mixed with a substantial portion of said entrained particulates from said effluent product stream in a separator;

dispersing water into said fraction after said fraction has been removed from said separator to form an emulsion;

separating said emulsion in a desalter into a dedusted stream of normally liquid oil having a substantially lower concentration of particulates than said fraction and a particulate laden residual stream having a higher concentration of said particulates than said fraction; and

combusting said particulate laden residual stream after said particulate laden residual stream has been removed from said desalter to form a spent stream for use as at least part of said solid heat carrier material in said retort.

4,415,435

CATALYTIC REFORMING PROCESS

William E. Lewis, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1982, Ser. No. 422,675
Int. Cl.³ C10G *35/06*
U.S. Cl. 208—65 **3 Claims**

1. In a process for reforming, with hydrogen, a naphtha in a cyclic reforming unit which contains a plurality of catalyst-containing on-stream reactors connected in series, and a catalyst-containing swing reactor which, due to an arrangement of

process piping and values comprising headers, can be substituted for any one of the on-stream reactors while the latter is off-stream from regeneration and reactivation of the catalyst, the catalyst is a platinum catalyst promoted with a hydrogenation-dehydrogenation component, or components, which increase the rate of hydrogenolysis as contrasted with an unpromoted platinum catalyst, the hydrogen and naphtha feed flows from one reactor of the series to another to contact the catalyst contained therein at reforming conditions, and prior to the introduction of the naphtha into said cyclic reforming unit the naphtha is passed through a hydrofiner and hydrofined to remove a preponderance of the sulfur, and the product thereform then passed through a guard chamber and contacted with a sulfur adsorbent to remove additional sulfur from said naphtha to render it a suitable reformer feed,

the improvement comprising

maintaining during the major portion of the reforming operating cycle via use of said hydrofiner and guard chamber a reformer feed naphtha sulfur level ranging from about zero to about 2 ppm, and

by-passing the hydrofiner and guard chamber with unhydrofined naphtha sufficient to provide a naphtha reformer feed having a sulfur concentration ranging from about 0.6 to about 10 ppm sulfur at the time of, or just prior to the time that a swing reactor containing an unsulfided catalyst is put back on oil, continuing to by-pass the hydrofiner and guard chamber until the catalyst is sufficiently sulfided, discontinuing the flow of by-pass feed, and then again passing the feed through the hydrofiner and guard chamber to the reformer unit.

4,415,436

PROCESS FOR INCREASING THE CETANE INDEX OF DISTILLATE OBTAINED FROM THE HYDROPROCESSING OF RESIDUA

Philip J. Angevine, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,976
Int. Cl.³ C10G *11/05, 65/12*
U.S. Cl. 208—89 **19 Claims**

1. A process for increasing the cetane index of distillate obtained from the hydroprocessing of petroleum residua which comprises passing a mixture of hydrogen and a metal- and/or sulfur-contaminated charge stock containing residua at a hydrogen partial pressure of from about 1,000 to about 3,000 psia a temperature of from about 650° F. to about 875° F. and a space velocity of from about 0.1 to about 2.0 LHSV through trickle beds of catalyst disposed in three sequential reaction zones, said first reaction zone containing a bed of at least one hydrotreating catalyst comprising a hydrogenating component selected from the group consisting of Group VIB and Group VIII metals and combinations thereof on a refractory support, said second reaction zone containing a bed of hydrocracking catalyst comprising a nickel-tungsten impregnated rare earth exchanged zeolite X component in combination with a nickel-tungsten impregnated silica-alumina matrix, and said third reaction zone containing a bed of at least one hydrotreating catalyst, the same or different from the hydrotreating catalyst in said first zone, comprising a hydrogenating component selected from the group consisting of Group VIB and Group VIII metals and combinations thereof on a refractory support thereby providing a distillate having a cetane index of at least about 50.

4,415,437

HYDROCARBON CRACKING USING TRANSITION METAL OXIDE BRONSTED ACID CATALYSTS

Dane C. Grenoble, Plainfield, and Lawrence L. Murrell, South Plainfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1981, Ser. No. 305,264
Int. Cl.³ C10G *11/04*
U.S. Cl. 208—120 **20 Claims**

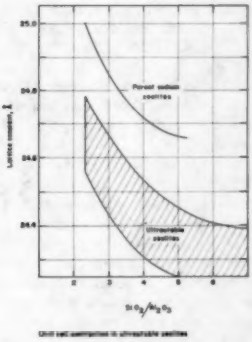
1. A process for cracking hydrocarbons comprising contacting a hydrocarbon feed, at elevated temperature and in a cracking zone, with a catalyst having primarily Bronsted acidity, said catalyst comprising at least one catalytic metal oxide selected from the group consisting essentially of the oxides of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof on an alumina support.

4,415,438

METHOD FOR CATALYTICALLY CONVERTING RESIDUAL OILS

Robert R. Dean, #1 Columbine La., Littleton, Colo. 80123; Warren S. Letzsch, 6533 S. Kearney Cir., Englewood, Colo. 80111, and Jean L. Mauleon, 15656 E. Grand Ave., Aurora, Colo. 80112

Filed Nov. 24, 1981, Ser. No. 324,450
Int. Cl.³ C10G *11/05*
U.S. Cl. 208—120 **17 Claims**



1. A method for upgrading a residual oil portion of crude oil boiling above 650° F. comprising metallo-organic compounds which comprises contacting said residual portion of crude oil boiling above 600° F. with a catalyst consisting of from 20 to 80 wt. % of an ultrastable faujasite crystalline zeolite dispersed in a silica-clay matrix for a time at a temperature particularly selective for conversion of the residual portion of crude oil to products of gasoline, light cycle oil and gasoline forming gaseous components, and

recovering said products comprising gasoline and light cycle oil.

4,415,439

CATALYTIC CRACKING CATALYST

Robert L. Chiang, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 298,671, Sep. 2, 1981, which is a continuation of Ser. No. 201,616, Oct. 28, 1980, abandoned. This application May 5, 1982, Ser. No. 375,235
Int. Cl.³ C10G *11/05*
U.S. Cl. 208—120 **6 Claims**

1. In a method for catalytically cracking hydrocarbons to obtain high octane gasoline fractions wherein said hydrocar-

bons are reacted under catalytic cracking conditions with a catalyst which comprises a zeolite mixed with an inorganic oxide matrix, the improvement comprising using a catalyst prepared by the process comprising:

(a) Exchanging a sodium type Y zeolite with an ammonium salt solution to lower the sodium content of said zeolite to below about 4 percent by weight Na_2O;

(b) calcining the ammonium exchanged zeolite at a temperature of from about 537° to 815° C.;

(c) mixing said calcined zeolite with an inorganic oxide matrix and water;

(d) spray drying said mixture; and

(e) reacting said spray dried mixture with an acid aluminum salt solution having a pH of from about 2.0 to 3.7 to lower the sodium content to below about 1.0 percent by weight Na_2O.

4,415,440

CRACKING CATALYST IMPROVEMENT WITH GALLIUM COMPOUNDS

John S. Roberts; Dwight L. McKay, and Brent J. Bertus, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 259,390, May 1, 1981. This application Sep. 8, 1982, Ser. No. 415,953

Int. Cl.³ C10G *11/04, 11/18*

U.S. Cl. 208—120 **21 Claims**

18. In a catalyst cracking process wherein a zeolite-containing cracking catalyst is circulated in a cracking unit between a cracking zone and a regeneration zone in a cyclic fashion, said process comprising:

(a) introducing the cracking catalyst and a hydrocarbon feedstock into the cracking zone, said hydrocarbon feedstock containing contaminants selected from the group consisting of nickel, vanadium, and iron;

(b) contacting the cracking catalyst with the hydrocarbon feedstock in the cracking zone under cracking conditions including the absence of added hydrogen wherein at least a portion of the contaminants in the feedstock become deposited on the cracking catalyst;

(c) withdrawing an effluent of cracking catalyst and cracked hydrocarbon feedstock including a gasoline fraction from the cracking zone;

(d) separating the cracking catalyst from the effluent;

(e) introducing the cracking catalyst into a regeneration zone;

(f) regenerating the cracking catalyst under elevated temperatures and in the presence of free oxygen-containing gas wherein contaminants deposited on the catalyst from the feedstock prevent complete regeneration of the cracking catalyst; and

(g) recycling the cracking catalyst to the cracking zone;

wherein an antimony-treated cracking catalyst is circulated in the cracking unit, said antimony-treated cracking catalyst having been contacted with an antimony-containing treating agent under conditions to deposit thereon a sufficient amount of antimony or an antimony-compound to at least partially passivate the at least one contaminant deposited on the catalyst from the feedstock; the improvement comprising

contacting the cracking catalyst with a treating agent selected from the group consisting of gallium and a compound of gallium, whereby the portion of the cracked hydrocarbon feedstock forming the gasoline fraction is increased.

4,415,441

CATALYTIC REFORMING PROCESS

Gerald E. Markley, and William E. Winter, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 13, 1982, Ser. No. 417,218

Int. Cl.³ C10G *35/08*

U.S. Cl. 208—138 **5 Claims**

1. In a process for reforming, with hydrogen, a naphtha in a reforming reactor provided with a rhenium promoted platinum catalyst over which the naphtha is contacted and reacted at reforming conditions to produce a C_5^+ liquid product of improved octane, the improvement comprising

contacting said catalyst on initiation of the reforming reaction at a maximum rate of about 75 percent of the hydrogen required for maintaining the optimum C_5^+ liquid yield over the length of the operating cycle, and thereafter

increasing the hydrogen rate to that required to maintain said optimum C_5^+ liquid yield not later than the time of line-out of the C_5^+ liquid yield.

4,415,442

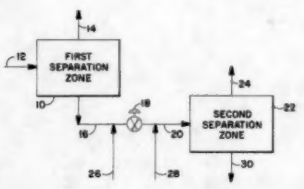
PROCESS FOR THE SEPARATION OF ENTRAINED ORGANIC FLUIDS FROM GASEOUS STREAMS IN A COAL DEASHING SYSTEM

Donald E. Rhodes, Oklahoma, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Sep. 24, 1981, Ser. No. 305,102

Int. Cl.³ C10G *31/00, 53/04*

U.S. Cl. 208—177 **2 Claims**



1. In a process for separating a feed mixture comprising soluble coal products, insoluble coal products and a solvent in a first separation zone, said solvent comprising at least one substance having a critical temperature below 800° F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310° F., cycloparaffin hydrocarbons having normal boiling points below about 310° F., open chain mono-olefin hydrocarbons having normal boiling points below about 310° F., open chain saturated hydrocarbons having normal boiling points below about 310° F., mono-, di- and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms and phenols containing from about 6–9 carbon atoms and their homologs, in which said feed mixture is maintained in said first separation zone at an elevated temperature and pressure to separate said feed mixture into a light fraction and a heavy fraction comprising insoluble coal products and some solvent including some soluble coal products dissolved therein and in which withdrawing said heavy fraction from said first separation zone and reducing the pressure level of said heavy fraction at least about 100 psig. results in the formation of a mixture of an ash concentrate and vaporous solvent together with entrained soluble coal products and separation of said vaporous solvent together with said entrained soluble coal products from said ash concentrate results in a deposition of said entrained soluble coal products upon the interior surface of a withdrawal conduit through which said separated vaporous solvent is passed, the improvement which comprises:

separating said mixture comprising ash concentrate and vaporous solvent together with said entrained soluble coal products in a fluidized bed comprising ash concentrate having an upper portion connected to said solvent withdrawal conduit, said mixture being introduced a sufficient depth below the top surface of said fluidized bed to cause said vaporous solvent to remain in contact with the ash concentrate particles in said fluidized bed for a sufficient time to coalesce or condense at least a portion of said entrained soluble coal products thereon and thereby separate the same from the vaporous solvent to prevent or substantially minimize deposition of said soluble coal products in said solvent withdrawal conduit.

4,415,443

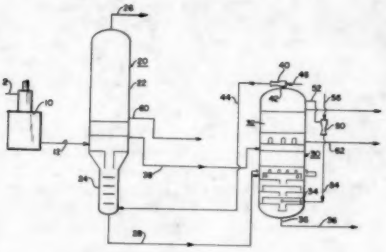
DISTILLATION PROCESS

Martin A. Murphy, Bernardsville, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 10, 1981, Ser. No. 282,046

Int. Cl.³ C10G 7/00; B01D 3/38

U.S. Cl. 208—355 **9 Claims**



1. A method for separating a feed into a distillate relatively rich in lower boiling components and a bottoms relatively rich in higher boiling components comprising:

(a) passing the feed into a first distillation zone having a first stripping zone and a first rectification zone, wherein the feed is separated into a first distillate removed from the rectification zone and a first bottoms removed from the stripping zone; and

(b) passing the first bottoms into a second distillation zone having a second rectification zone and a second stripping zone wherein the second distillation zone operates at a lower absolute pressure than the first distillation zone and wherein the bottoms from the first stripping zone are separated into a second distillate and a second bottoms, the rectification zone of the second column communicating with a fluid ejection means, whereby second distillate from the second rectification zone is transferred by the fluid ejection means into the first stripping zone without condensation.

4,415,444

AIR COOLING SYSTEM FOR A VIBRATORY SAND RECLAIMING APPARATUS

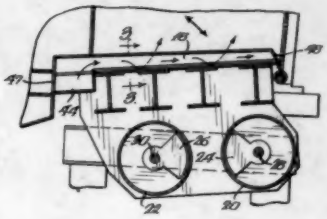
William G. Guptail, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Oct. 8, 1981, Ser. No. 309,560

Int. Cl.³ B07B 1/58

U.S. Cl. 209—3 **6 Claims**

1. In a vibratory material treatment device having a U-shaped hopper at least partially tipped to one side thereof and adapted to receive material to be treated along said side, a first eccentric weight and motor set located on one side of the center of gravity of the hopper and operable for applying a first vibratory force to said hopper in a direction such that the material will advance from said one side toward the base of the hopper; a second eccentric weight and motor set located on the other side of the center of gravity of the hopper and operable for applying a second vibratory force to said hopper in a direction such that the resultant force from said first and second forces will advance material longitudinally from said base toward said side and out of said hopper; the improvement comprising a plurality of substantially hollow longitudinally extending conducting means situated adjacent the lower region



of said chamber, each defining in conjunction with the chamber a substantially closed conduit; means communicating air under pressure from an external supply to said conducting means and filling the conduits; and means associated with said conducting means for distributing air under pressure from the conduits into the chamber for cooling the heated sand as it is reduced from lumps to particles of sand.

4,415,445

PROCESS FOR THE AGGLOMERATION OF SOLIDS

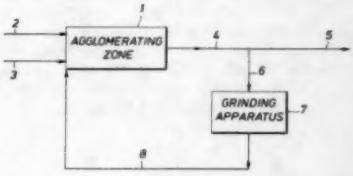
Arie Van Hattem; Johan A. Prommel, and Augustinus W. M. Roes, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1982, Ser. No. 371,105

Claims priority, application United Kingdom, Aug. 6, 1981, 8124112

Int. Cl.³ B03B 1/00

U.S. Cl. 209—5 **4 Claims**



1. A process for agglomerating finely divided coal particles suspended in aqueous liquid comprising:

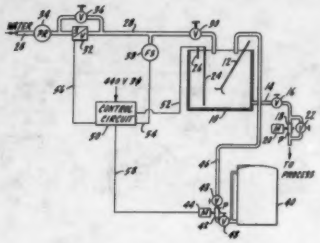
flowing substantially continuous streams of an aqueous liquid suspension of fine coal particles having diameters less than 0.25 mm and an oily binder material into an agglomerating zone maintained under turkulant flow and

concurrently continuously flowing into the agglomerating zone an aqueous liquid suspension of seed particles consisting essentially of coal or coal agglomerates having diameters which are substantially all between about 0.5 and 1 mm so that the proportion of the seed pellets within the agglomerating zone is maintained at about 10 to 30% of the solid particles within that zone and the agglomeration of the fine coal particles accomplished by layering rather than by coalescence.

4,415,446
AUTOMATIC CHEMICAL SOLUTION MIXING UNIT

James A. Osborne, Kingsport, Tenn., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 4, 1982, Ser. No. 345,689
Int. Cl.³ C02B 1/18
U.S. Cl. 210—101 5 Claims



1. In a water treatment facility, an automatic system for making up a chemical solution for use in the facility, comprising:

a mixing tank having high and low liquid level switches disposed therein;

a water supply line for supplying water to the mixing tank, the line including a remotely-controlled solenoid valve for controlling the flow of water to the mixing tank;

a pressure regulator in the water supply line which maintains the water pressure between about 5 pounds per square inch and 125 pounds per square inch;

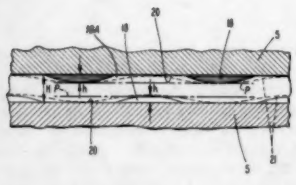
a chemical supply tank and a line for supplying treatment chemical directly to the mixing tank; and

an electrical control circuit responsive to the level switches in the mixing tank to operate the solenoid valve and the pump when needed so that the input of water and treatment chemical to the mixing tank is responsive to the liquid level in the mixing tank and a supply of chemical solution in the mixing tank is maintained.

4,415,447
SEPARATORY APPARATUS COMPRISING MEANS FOR ANCHORING A SEMI-PERMEABLE MEMBRANE TO A SUPPORT MEMBER

Jacques Foucras, Bron, and Georges Rodet, Communay, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 105,916, Dec. 21, 1979, abandoned.
This application Sep. 14, 1981, Ser. No. 301,533
Claims priority, application France, Dec. 21, 1978, 78 37029
Int. Cl.³ B01D 31/00
U.S. Cl. 210—321.1 19 Claims

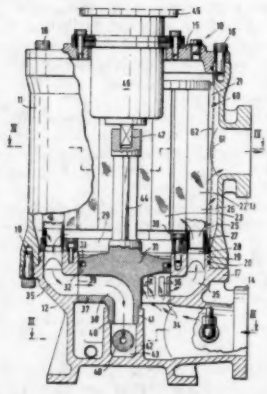


1. Separatory apparatus especially adapted for ultrafiltration comprising a plurality of support plates of generally elongate shape and each defining a longitudinal axis, said plates secured together in a leaktight manner and spaced apart from one another at their peripheries, each support plate including two oppositely disposed faces in which are formed a plurality of longitudinally spaced fluid conducting orifices for conducting fluid to be treated, each of said faces defining a cell, a semi-permeable membrane covering each cell, said plates being arranged such that a membrane covering the cell of one of said plates faces a membrane covering a cell of an adjacent plate and is spaced therefrom to define a fluid passage therebetween which passage communicates with said orifices to conduct fluid to be treated, each support plate including parallel ribs disposed in the respective cell and extending in a direction transverse relative to said longitudinal axis, each rib defining opposite ends and an outer edge extending in said transverse direction from one of said ends to the other said end, said ribs being spaced apart along said longitudinal axis to define grooves therebetween, a discharge channel disposed adjacent a peripheral edge of each said cell and communicating with said grooves of its associated cell to receive ultrafiltrate from such grooves, said outer edges of at least some of said ribs of each cell being of irregular profile and forming alternating portions which are raised and recessed relative to one another along the respective rib outer edge so as to contact the associated membrane and define membrane anchoring means therefor, said raised portions each defining an outermost section, a plurality of said outermost sections of a respective cell defining an imaginary plane extending parallel to the respective cell, said outermost sections of each of said mutually facing cells terminating short of the imaginary plane of the other of said mutually facing cells.

4,415,448
FLUSH-BACK FILTER

Rüdiger Lennartz, Pulheim, and Joachim Gutermuth, Gettorf, both of Fed. Rep. of Germany, assignors to Boll & Kirch Filterbau GmbH, Kerpen, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,349
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115716
Int. Cl.³ B01D 23/24
U.S. Cl. 210—333.1 18 Claims

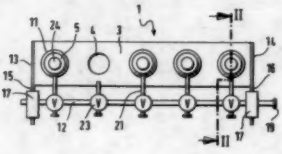


1. A flush-back filter having an axis comprising a filter housing, a filter inlet, a filter outlet, a group of filter elements, a sludge drain and a rotary flushing member, said filter elements being arranged in at least two concentric circles, ducts arranged in a circle around the filter axis communicating with said filter elements, each of said ducts opening out into an opening on a cylindrical distributor surface to which said flushing member faces with its peripheral surface and, said flushing member having a diameter which is smaller than the diameter of the inner circle of said filter elements and a flushing channel which opens into a connection opening on its cylindrical peripheral surface adapted to successively engage said cylindrical distributor surface openings.

4,415,449
VACUUM FILTRATION BENCH

Wolfgang Hein, Dassel, Fed. Rep. of Germany, assignor to Carl Schleicher & Schuell GmbH & Co. KG, Einbeck, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,131
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138256
Int. Cl.³ B01D *23/26*
U.S. Cl. 210—406 **15 Claims**

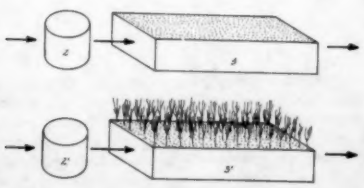


1. A bench for vacuum filtration of fluid samples comprising bench means in the form of a stand which is generally horizontally disposed, said stand having a closed bottom, aperture means on said stand defining a plurality of apertures overlying said bottom, a plurality of filtration means each comprising a filtration device and a suction flask, each of said suction flasks which may be of differing sizes being supported on said bottom of said stand and each being received close fitted in one of said apertures, a vacuum distribution conduit rigidly mounted on said stand, a connector on said vacuum distribution conduit for connection to a vacuum source, a plurality of vaccum branch conduits, each of said branch conduits extending between said vacuum distribution conduit and one of said suction flasks, each of said vacuum branch conduits being provided with an isolating valve between each of said suction flasks and said vacuum distribution conduit, and a plurality of vacuum connections, each of said vacuum connections being provided between each of said branch conduits and each of said suction flasks arranged so as to enable filtrate from any individual filtration means to be collected and worked up without interruption to the filtration process of all or any other of said filtration means.

4,415,450
METHOD FOR TREATING WASTEWATER USING MICROORGANISMS AND VASCULAR AQUATIC PLANTS

Billy C. Wolverton, Picayune, Miss., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 28, 1981, Ser. No. 335,036
Int. Cl.³ C02F *3/30, 3/32*
U.S. Cl. 210—602 **17 Claims**

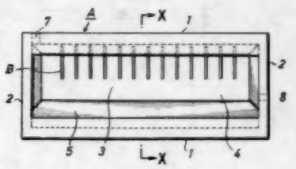


1. A method for treating wastewater comprising the steps of subjecting the wastewater to an anaerobic settling step for at least 6 hours and passing the liquid effluent from the anaerobic settling step upwards through a filter bed, wherein the effluent is subjected first to the action of anaerobic and facultative microorganisms disposed on a particulate media in a lower portion of said bed and then to the action of aerobic microorganisms disposed on a particulate media in an upper portion of said bed and the roots of at least one vascular aquatic plant.

4,415,451
PROCESS FOR WASTE WATER DISPOSAL

Hisashi Suzuki, Akishima, Japan, assignor to Iseki & Co., Ltd., Matsuyama, Japan

Continuation of Ser. No. 122,197, Feb. 19, 1980, abandoned. This application Aug. 25, 1981, Ser. No. 296,127
Int. Cl.³ C02F *3/08*
U.S. Cl. 210—610 **5 Claims**



1. A process for waste water disposal wherein waste water of high BOD concentration of from 3,000 to 100,000 ppm is aerated in an aeration vessel having a BOD load of from 3 to 30 Kg/m^3 (of aeration vessel) per day so as to reduce the BOD concentration thereof, comprising a first step of implanting micro-organisms comprising alcohol fermentation organisms on coal particles (except peat, and pitch and smokeless coal having a carbon content of 84% or higher) of which at least 90% are of a particle size between 2 and 5 mm and not more than 50% are of particle size difference which is within the range of 0 to 0.5 mm by mixing said coal particles with a proteinaceous substance in the presence of moisture, and fermenting to implant said microorganisms on said coal particles outside of said aeration vessel, said coal particles being selected from the group consisting of brown coal and lignite, and then introducing and circulating said micro-organism implanted coal particles in an amount of 5 to 25 Kg/m^3 (of aeration vessel) within said aeration vessel in contact with said waste water, to treat said waste water, and introducing air into said aeration vessel containing said waste water in an amount sufficient to maintain between 2 and 7 ppm of dissolved oxygen in said waste water, to treat said waste water and greatly reduce the BOD concentration, and removing said treated waste water from said aeration vessel which contains said circulating micro-organism implanted coal particles.

4,415,452
METHOD AND APPARATUS FOR TREATING ORGANIC WASTEWATER

Richard W. Heil, 30 Arthur Ave., Clarendon Hills, Ill. 60514 and Thomas A. Rose, 351 South Waiola Ave., La Grange, Ill. 60525

Filed Mar. 18, 1982, Ser. No. 359,585
Int. Cl.³ C02F *3/20*
U.S. Cl. 210—614 **10 Claims**

1. The method of treating organic waste water with activated sludge comprising the steps of:

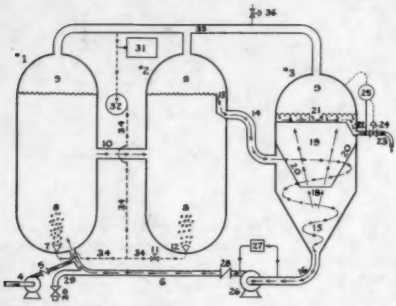
establishing an enclosed continuous flow way for the organic waste water and the activated sludge in a mixed liquor form including several aeration chambers, and a separator chamber that are air pressurized to a predetermined pressure, that contain organic waste water and activated sludge, and that are consecutively connected in a continuous flow circuit through said aeration chambers, said separator chamber, and return flow to said one aeration chamber,

mixing activated sludge and fresh organic waste water in said return flow,

passing the return flow into said one aeration chamber adjacent the lower end thereof,

dosing the body of the liquor of said one aeration chamber with air in diffused bubble form for flocculating and air saturation of the sludge,

passing continuously from said liquor body a flow of the liquor to a subsequent of said aeration chambers having a second liquor body while diffusing air into said second body from the lower end of same for providing a liquor flow in which the flocculated sludge has assimulated the organic waste in the liquor flow,



continuously passing in a gravity flow to said separator chamber the organic waste assimilated liquor flow, and establishing and maintaining in said separator chamber and in said organic waste assimilated liquor flow a cyclone separating action effecting centrifugal force and gravity induced settling out of the sludge flow thereof to provide said return flow, and a rising effluent centrate flow,

continuously clarifying and discharging the centrate flow as tertiary quality effluent,

and continuously pumping said return flow to effect said mixing and said first mentioned passing steps.

4,415,453

ANAEROBIC TREATMENT

Enrique R. Witt; William J. Humphrey, and James P. Cave, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

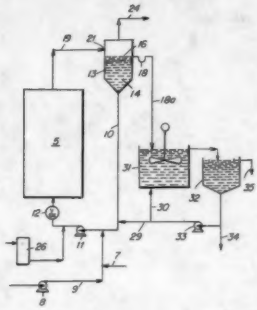
Continuation of Ser. No. 198,909, Oct. 21, 1980, Pat. No. 4,366,059, which is a continuation of Ser. No. 150,829, May 19, 1980, Pat. No. 4,315,823, which is a continuation of Ser. No. 57,545, Jul. 13, 1979, abandoned, which is a continuation of Ser. No. 737,241, Oct. 29, 1976, abandoned. This application Jul. 26, 1982, Ser. No. 401,783

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ C02F *3/28*

U.S. Cl. 210—615 **2 Claims**

1. Process for the treatment of aqueous organic waste streams in an anaerobic filter, with concomitant production of methane gas while supplying alkaline material to the filter to neutralize acids fed thereto and formed therein, to produce a liquid effluent stream containing said methane gas from said filter, said liquid effluent stream having a lower C.O.D. content than said waste stream and containing less than 600 mg per liter of volatile suspended solids, said process comprising separating said methane gas from said liquid effluent stream, separating said liquid stream into two liquid streams, hereafter termed a and stream b, withdrawing said liquid stream a while recycling said liquid stream b to said filter and blending said stream b together with fresh feed of said waste stream, the volumetric rate of said fresh feed being about the same as the volumetric rate of withdrawal of said liquid stream a, and the ratio of said volumetric rate of feed to the volumetric rate of said recycle being in the range of about 1:1 to 1:20, in which process said fresh feed of said waste stream has a C.O.D. of at least about 5000 mg/l, the fresh feed is supplied at a rate which is at least about 0.5 lb C.O.D. per cubic foot of filter per day, the mixture of said liquid b and said fresh feed has a C.O.D. of at least about 500, said filter comprises packing of such con-



struction that the void volume is above 60%, the hydraulic feed rate in said filter is at least about 1 foot per hour, said acids including formic, acetic, or propionic acid, said supplied alkaline material comprising solid MgO, said MgO being converted by contact with said acids to form dissolved magnesium carboxylate salt, the CO_2 partial pressure in said filter being at least 1/5 atmosphere, the Mg concentration in the total feed to said filter being not above about 0.2 gram equivalent per liter.

4,415,454

NITRIFICATION TREATMENT OF WASTEWATER

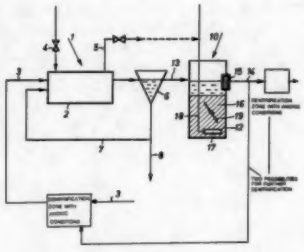
Uwe Fuchs, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 1, 1981, Ser. No. 298,430

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1980, 3032882

Int. Cl.³ C02F *3/08*

U.S. Cl. 210—616 **10 Claims**



1. In a process for the biological treatment of wastewaters in an activated sludge plant comprising two stages, where in the first stage the major proportion of the organic pollutants is decomposed and in the second stage the decomposition of the residual organic pollutants is conducted in conjunction with nitrification of nitrogen compounds in the presence of nitrogen bacteria, the improvement comprising conducting nitrification in a second stage reactor containing nitrifying bacteria fixed on a low-density, particulate, organic, macroporous carrier material, said low density being about 10–200 kg/m^3, the pores of the carrier material being open macropores of about 0.1 to 5 mm in diameter, and the particles having a diameter of 0.5–50

mm, and wherein said second second stage is a thoroughly mixed activation tank with the nitrification being conducted in the second stage activation tank with a proportion by volume of the carrier material of 10 to 40% of the total volume of the second stage activation tank.

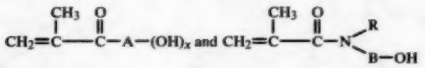
4,415,455

REVERSE OSMOSIS MEMBRANES BASED ON HYDROXYALKYL METHACRYLATE AND METHACRYLIC ACID COPOLYMERS

Peter Osei-Gyimah, North Wales; Peter G. Cartier, Glenside, and Paul E. Ellis, Downingtown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 9, 1982, Ser. No. 440,417
Int. Cl.³ B07C 9/00
U.S. Cl. 210—654 **17 Claims**

1. A composite material suitable for use as a reverse osmosis membrane comprising a microporous substrate and, supported thereon, a thin, water-permeable desalinizing film, said desalinizing film comprising a copolymer of methacrylic acid and a hydroxy-containing monomer selected from



wherein R is alkyl of 1 to 4 carbon atoms or BOH, A and B are alkylene having from 2 to about 4 carbon atoms, and x is 1 or 2, said film crosslinked by acid catalyzed ester formation.

4,415,456

REMOVAL AND DESTRUCTION OF RESIDUAL NITRATE ESTERS IN WASTEWATER

Carl D. Chandler, Jr., Dublin, Va., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 24, 1982, Ser. No. 361,633
Int. Cl.³ C02F 1/28
U.S. Cl. 210—673 **17 Claims**

1. A process for destroying amounts of an organic nitrate ester carried at low levels in a wastewater effluent, said process comprising:

intimately contacting an initial fraction of said wastewater effluent with a solid adsorbent to concentrate a first of said amounts as an initial adsorbate of said solid adsorbent that thereby becomes spent;

intimately contacting said spent adsorbent with an aqueous regenerating fluid comprising a solvent for said nitrate ester and that displaces a portion of said adsorbate and decomposes said nitrate ester thereof;

washing residual amounts of decomposition products of said nitrate ester and said aqueous regenerating fluid from said spent adsorbent so contacted to provide a washed adsorbent;

intimately contacting a subsequent fraction of said wastewater effluent with said washed adsorbent to concentrate another of said amounts as a subsequent adsorbate of said solid adsorbent.

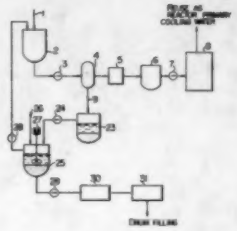
4,415,457

PROCESS FOR TREATING LIQUID WASTE CONTAINING SOLID FINE PARTICLES

Kiyotaka Shirosaki; Yoshikazu Sugimoto, both of Hitachi, and Masaki Takeshima, Komae, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1981, Ser. No. 243,069
Claims priority, application Japan, Mar. 13, 1980, 55-32492
Int. Cl.³ C02F 1/42; G21F 9/12
U.S. Cl. 210—682 **7 Claims**

1. A process for treating backwash water of a non-filter aid type filter used in filtering radioactive liquid waste discharged from the primary cooling water system of an atomic power plant for reuse, which comprises leading backwash water containing suspended radioactive cruds comprised of radioactivated iron oxide particles from the non-filter aid type filter to a waste resin settling tank for backwash water containing waste ion exchange resin powder from a filter-demineralizer of a condensation-purification system of the atomic power plant, mixing the backwash water from the non-filter aid type filter with an effective amount of the backwash water from the



filter-demineralizer in the tank, thereby allowing the cruds contained in the backwash water from the non-filter aid type filter to be adsorbed onto the waste ion exchange resin powder, and settling the crud-absorbed waste ion exchange resin powder, thereby separating and removing the cruds from the backwash water from the non-filter aid type filter and recycling resultant supernatant from the waste resin settling tank to the non-filter aid type filter in the primary cooling system.

4,415,458

FLOCCULATING REAGENTS

Pearl M. Klein, Rofario Dominicana, F.A. Avenue 27 De Febrero 220 Post Office Box 944, Santo Dominga, Dominican Republic

Filed Feb. 19, 1982, Ser. No. 350,372
Int. Cl.³ C02F 1/54
U.S. Cl. 210—727 **26 Claims**

1. A method for flocculating aqueous suspensions of fine particules in relatively short periods of time, comprising the step of:

(a) admixing with said suspension, an effective amount of a flocculating reagent selected from the group consisting of:

(1) orange peel extract,

(2) corn husk extract, and

(3) a mixture of orange peel extract and corn husk extract.

4,415,459

WASTE DISPOSAL SYSTEMS AND METHODS

Moody L. Coffman, 1832 NW. 17th St., Oklahoma City, Okla. 73106, and Lawrence R. Bradshaw, Jr., P.O. Box 14231, Oklahoma City, Okla. 73113

Filed Jun. 8, 1981, Ser. No. 271,818
Int. Cl.³ G21F 9/22
U.S. Cl. 210—747 **45 Claims**

1. A system for disposing of wastes comprising:

a disposal site including:

a base which is substantially liquid impermeable; and

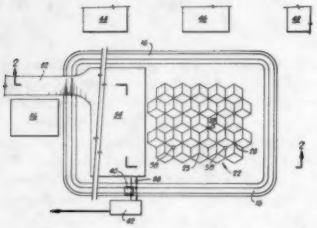
a geometrically indexing support structure on said base and including an upper side geometrically configured to contact and support a plurality of contiguously placed waste containers of identical shape, said upper side having a configuration complementary and identical to the collective downwardly facing surfaces of a multiplicity of said containers when arrayed in horizontal alignment and in abutting contact with each other so that no lateral spaces or voids exist between said containers; and

a plurality of identically shaped polyhedron waste containers stacked on said geometrically indexing support struc-

ture in an array to extend in horizontal alignment, in vertical tiers of horizontally aligned containers with said containers collectively occupying the minimum possible volume permitted by their solid geometry, the geometric shape of each of said containers being such that each of said containers has at least eight identical faces and each and every face of each container can be flatly abutted against an identically shaped face on a different container, and with all such abutting faces concurrently contacted during stacking of the containers above that first tier of horizontally aligned containers supported on the upper side of said support structure.

32. A method of storing and utilizing waste matter in an environmentally safe, space-conservative manner comprising:

placing the waste matter in a plurality of stackable, identically shaped, polyhedron containers, each having at least eight identical sides and configured to register with contiguously positioned identical containers therearound to



thereby form a geometric solid containing solely voids constituted by the waste matter-containing hollow interior of the several containers;

selectively stacking the waste matter-containing containers on a supporting structure in vertical tiers, with each tier containing a plurality of horizontally aligned containers in contiguous abutting relationship, and with no space between containers within the stack, said supporting structure including as upper side geometrically configured to contact and support a plurality of said contiguously placed waste containers of identical shape, said upper side having a configuration complementary and identical to the collective downwardly facing surfaces of a multiplicity of said containers when arrayed in horizontal alignment and in abutting contact with each other so that no lateral spaces or voids exist between said containers; and

indexing and registering the location of each container in the stack to facilitate future location and retrieval thereof to gain access to the waste material stored therein.

4,415,460

OXIDATION OF ORGANICS IN AQUEOUS SALT SOLUTIONS

George D. Suciu, Ridgewood, and John E. Paustian, Whippany, both of N.J., assignors to The Lummus Company, Del.

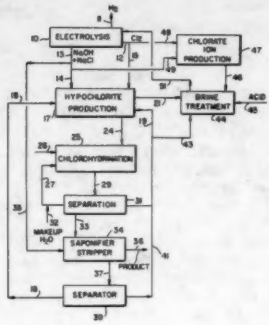
Continuation of Ser. No. 157,117, Jun. 6, 1980, abandoned, which is a division of Ser. No. 61,743, Jul. 30, 1979, Pat. No. 4,240,885. This application Apr. 19, 1982, Ser. No. 369,352

Int. Cl.³ C02F *1/76*

U.S. Cl. 210—754 **19 Claims**

1. A process for treating an aqueous salt solution containing organic impurities wherein said salt is selected from the group consisting of alkali and alkaline earth chlorides, and said organic impurities are comprised of a member selected from the group consisting of glycols, aldehydes, ethers, carboxylic acids, hydrocarboxylic acids, hydroxyketones, chloroketones, chloro-organic acids, ketoacids, and chloroalcohols, comprising:

oxidizing the organic impurities to convert the carbon atoms of the organic impurities to substantially carbon dioxide, said oxidizing consisting essentially of treatment with



chlorate ions at a pH of no greater than 5.0 and a temperatue of at least 130° C.

4,415,461

PROCESS FOR TREATING RESIDUAL WATERS CONTAINING AROMATIC AMINES

Jean E. Mansel, Labeuvriere; Charlie M. P. Masson, Mons-en-Baroeul; Paul Bertaux, Saint Andre, and Andre M. J. Grosmaitre, Marquette Les Lille, all of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jan. 3, 1983, Ser. No. 455,157

Claims priority, application France, Jan. 15, 1982, 82 00565

Int. Cl.³ C02F *1/70, 1/72*

U.S. Cl. 210—757 **13 Claims**

1. A process for destroying primary aromatic amines in residual waters which comprises treating the residual waters containing said amines at a temperature between 40° C. and 90° C. for a period longer than 5 minutes with a mixture of sulfuric acid and nitric acid, the final pH of the reaction medium being lower than 3.

4,415,462

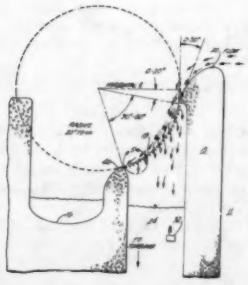
SELF-CLEANING SCREEN

Harvey E. Finch, 121 Shooting Star Isle, Foster City, Calif. 94404, and James J. Strong, 440 Vidal, San Francisco, Calif. 94132

Filed Aug. 12, 1982, Ser. No. 407,467

Int. Cl.³ B07B *1/06*

U.S. Cl. 210—767 **13 Claims**



1. An apparatus for screening intake water for hydraulic turbine diversions from a river or the like, the apparatus comprising:

a check dam across the river for maintaining a first water level in the river;
a side channel weir on one bank of the river upstream of the check dam, the elevation of the weir being sufficiently lower than the check dam for diverting water to flow over the weir;
a first water channel having an inlet upstream of the weir and an outlet downstream of the check dam, the first water channel being spaced laterally from the weir at a lower elevation than the weir;
a stationary screen connected between the weir and the first water channel; and
a second water channel under the screen for supplying water passing through the screen to an intake of a hydraulic turbine.

4,415,463

PREPARATION OF VISCOSIFIERS FOR ZINC SALT WORKOVER AND COMPLETION BRINES

Benjamin Mosier, Houston, Tex.; Jack L. McCrary, and Karl G. Guilbeau, both of Lafayette, La., assignors to The Dow Chemical Co., Midland, Mich.

Continuation of Ser. No. 51,157, Jun. 22, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 277,509

Int. Cl.³ E21B *43/00*

U.S. Cl. 252—8.55 R **13 Claims**

1. The process of preparing a viscosifier for addition to clear water salt brines used as oil well workover and completion fluids, comprising:

(a) forming a treating solution comprising a basic nitrogen reagent dissolved in a solvent carrier, said reagent being selected from the class consisting of dimethyl dialiphatic quaternary ammonium salts, and dimethylol urea, said aliphatic groups containing from 8 to 22 carbons, said solvent carrier being selected from the class consisting of organic polar solvents in which said reagent is soluble and mixtures thereof with a minor proportion of water, said treating solution containing from 0.25 to 15% by weight of said reagent; and

(b) contacting said treating solution with a natural polysaccharide gum suitable for use in salt brine workover and completion fluids, said gum being in the form of a particulate solid, a sufficient amount of said treating solution being used to wet said particulate gum, said gum being maintained in essentially unswollen condition during said contacting.

4,415,464

FARADAY ROTATION GLASS

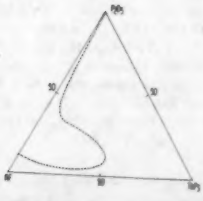
Yoshiyuki Asahara, Higashiyamato, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Continuation of Ser. No. 967,766, Dec. 8, 1978, abandoned, which is a continuation of Ser. No. 868,245, Jan. 10, 1978, abandoned. This application Mar. 12, 1982, Ser. No. 357,447

Claims priority, application Japan, Jan. 13, 1977, 52-2717

Int. Cl.³ C03C *3/16, 3/18, 3/30*

U.S. Cl. 252—62.51 **2 Claims**



1. A Faraday rotation glass consisting essentially of in mole %,

P_2O_5	5 to 30% where up to 5/6 on a molar basis of the P_2O_5 can be replaced by B_2O_3;
TbF_3	11.4 to 45%;
AlF_3	0 to 25%; and
RF	at least 40%

where RF includes at least 3% BaF_2, 0 to 64% MgF_2, 0 to 32% NaF, 0 to 40% SrF_2, 0 to 26% CaF_2, 0 to 20% LiF and 0 to 20% KF.

4,415,465

HEAT-STORING COMPOSITION

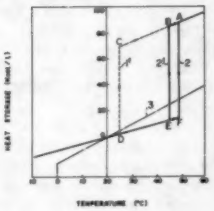
Keiichi Koike, Matsudo, and Michio Yanadori, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,737

Claims priority, application Japan, Mar. 13, 1981, 56-35193; Sep. 21, 1981, 56-149267; Nov. 6, 1981, 56-177221

Int. Cl.³ C09K *3/18*

U.S. Cl. 252—70 **10 Claims**



1. A heat-storing composition which comprises sodium thiosulfate pentahydrate and naphthalene as a nucleating agent.

4,415,466

REVERSIBLE PHASE CHANGE COMPOSITIONS OF CALCIUM CHLORIDE HEXAHYDRATE WITH POTASSIUM CHLORIDE

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 31, 1982, Ser. No. 364,159

Claims priority, application Japan, Apr. 15, 1981, 56-055719

Int. Cl.³ C09K *5/06*

U.S. Cl. 252—70 **40 Claims**

19. In a reversible liquid/solid phase change composition comprising a mixture of $CaCl_2.6H_2O$/KCl/NaCl/$SrCl_2.6H_2O$ and impurities in an amount of less than 3 weight percent of the total weight of the composition, the improvement comprising the addition of KCl and NaCl in amounts sufficient to obtain an effectively congruently melting mixture.

4,415,467

AGENT FOR THE PURIFICATION OF WASTE WATERS AND PROCESS FOR ITS PRODUCTION

Ralf F. Piepho, Wennigsen, Fed. Rep. of Germany, assignor to Colloid Piepho, Wilmington, Del.

Continuation-in-part of Ser. No. 240,874, Mar. 5, 1981, Pat. No. 4,332,693, which is a continuation of Ser. No. 867,240, Jan. 6, 1978, abandoned. This application Jun. 1, 1982, Ser. No. 383,608

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ C02F *1/28, 5/10*; B01J *20/12, 20/34*

U.S. Cl. 252—181 **16 Claims**

1. A chemical composition for the treatment of contami-

nated waste waters, especially waste waters in the form of oily emulsions, the agent comprising activated bentonite; bentonite containing calcium aluminum silicate in an amount of at least 30% based on the dry weight of activated bentonite; lime (CaO or $Ca(OH)_2$ in an amount of at least 50% based on the dry weight of bentonite containing calcium aluminum silicate; a contaminant coagulant; and an acid or acid salt.

4,415,468

DEODORIZATION OF N-VINYL MONOMERS

Albert C. Chen, East Brunswick, and Frank A. Nagy, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1981, Ser. No. 260,572
Int. Cl.³ A61L *9/01*
U.S. Cl. 252—182 **10 Claims**

1. A deodorized composition at least one odoriferous N-vinyl monomer and a sufficient deodorizing amount of an alkali metal bisulfite.

4,415,469

PHASE STABLE COMPOSITIONS CONTAINING A PARAFFINIC POLYOL AND AN ISOCYANATE REACTIVE PREPOLYMER

Chung-Chieh Tsai, South Salem, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 2, 1981, Ser. No. 317,102
Int. Cl.³ C08G *63/42, 59/40;* C08F *233/00;* C08K *3/00*
U.S. Cl. 252—182 **19 Claims**

1. A process for producing a phase-stable solution composition comprising an isocyanate reactive prepolymer containing hydroxy and epoxy groups and a paraffinic polyol chain extender which comprises heating the prepolymer and polyol in the presence of one another to yield said phase-stable solution composition.

11. A phase stable solution composition comprising an isocyanate reactive prepolymer containing hydroxy and epoxy groups and a paraffinic polyol chain extender, said composition being essentially free of a compatibilizing agent for said prepolymer and polyol.

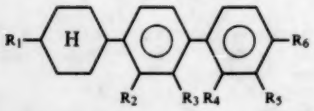
4,415,470

LIQUID CRYSTALLINE FLUORINE-CONTAINING CYCLOHEXYLBIPHENYLS AND DIELECTRICS AND ELECTRO-OPTICAL DISPLAY ELEMENTS BASED THEREON

Rudolf Eidenschink, Dieburg, and Ludwig Pohl, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 320,146
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1980, 3042391
Int. Cl.³ C09K *3/34;* G02F *1/133;* C07C *121/64, 25/18, 43/225*
U.S. Cl. 252—299.63 **8 Claims**

1. A cyclohexylbiphenyl of the formula



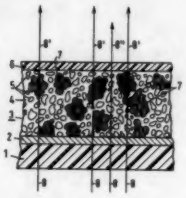
wherein R_1 is alkyl of 1–12 C atoms; R_6 is alkyl or alkoxy each of 1–12 C atoms, CN or fluorine; and R_2, R_3, R_4 and R_5 each is hydrogen or fluorine, with the proviso that at least one of R_4 and R_5 is fluorine, but not more than two of R_2, R_3, R_4, R_5 and R_6 are fluorine.

4,415,471

X-RAY FLUORESCENT SCREENS

Heinz Degenhardt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,327
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114438
Int. Cl.³ C09K *11/06*
U.S. Cl. 252—301.36 **6 Claims**



1. An x-ray fluorescent screen comprised of a fluorescent layer having a luminescent material bound in a lacquer binding system characterized by pronounced hydrophilic properties, said luminescent material comprising a rare earth luminescent material having oxyhalides and/or oxysulfides as a base, and said binding system comprising a urea-formaldehyde resin containing about 10 to 90% by weight of an additive selected from the group consisting of alkyd resins, epoxy resins, polyacrylate resins, nitrocellulose, vinyl chloride copolymers, polyvinyl butyral and mixtures thereof.

4,415,472

MIXTURE OF ALKALI SALTS OF SULFO-SUCCINIC ACID DIALKYLESTERS AND HIGHER ALIPHATIC ALCOHOLS, USE THEREOF TO DEFOAM MINERAL ACID DECOMPOSITION MEDIA

Reinmar Peppmöller, Krefeld, Fed. Rep. of Germany, assignor to Chemische Fabrik Stockhausen GmbH, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,441
Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018758
Int. Cl.³ B01D *17/00*
U.S. Cl. 252—321 **20 Claims**

1. A defoamer which is a mixture comprising
(a) at least one alkali salt of at least one sulfosuccinic acid dialkylester wherein the alkyl groups are the same or different and are linear or branched alkyl groups containing 7 to 20 carbon atoms, and
(b) at least one higher unbranched or branched aliphatic alcohol containing 6 to 20 carbon atoms, the weight ratio of component (a) to component (b) being ¼ to 40/1.

4,415,473

WATER GAS SHIFT REACTION EMPLOYING INTERCALATED METAL CARBONYL COMPLEX CATALYST COMPOSITION

James A. Hinnenkamp, Hamilton, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 207,166, Nov. 17, 1980, Pat. No. 4,324,695. This application Nov. 25, 1981, Ser. No. 325,180
Int. Cl.³ C01B *3/16*
U.S. Cl. 252—373 **5 Claims**

1. In the catalyzed water gas shift reaction, the improvement which comprises using as catalyst a catalytically effective amount of an intercalate composition comprising graphite intercalated with a transition metal carbonyl.

4,415,474

CATALYSTS USEFUL FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Kenneth C. Benton, Garfield Heights; Brian L. Cmolik, Parma, and Raymond J. Weinert, Garfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 16, 1982, Ser. No. 349,114
Int. Cl.³ C08F 4/64
U.S. Cl. 502—117 5 Claims

1. A Ziegler-type transition metal complex catalyst comprising

(1) a transition metal compound; and

(2) a 1-phenyl-2-(dialkyl alumino)-1-heptene activator.

4,415,475

MIXED METAL OXIDE CATALYST CONTAINING TITANIUM, BORON AND MOLYBDENUM VALUES

Thomas S. Brima, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 280,172, Jul. 2, 1981, Pat. No. 4,358,601. This application Jun. 18, 1982, Ser. No. 390,142
Int. Cl.³ B01J 21/02
U.S. Cl. 502—206 10 Claims

1. A catalyst consisting essentially of a mixed metal oxide of titanium, boron and molybdenum values prepared by the process which comprises reacting titanium halide with ammonium heptamolybdate, and reacting the resulting product with boric acid or alkyl borate and thereafter calcining the recovered solid in an inert or oxygen-containing atmosphere.

4,415,476

SILVER-BASED CATALYST CONTAINING CHLORINE AS AN ANIONIC COMPONENT FOR THE PRODUCTION OF ETHYLENE OXIDE

Akimi Ayame, Muroran; Naohiro Nojiri, and Yukio Sakai, both of Ami, all of Japan, assignors to Mitsubishi Petrochemical Co. Ltd., Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,978
Claims priority, application Japan, Feb. 25, 1981, 56-25417
Int. Cl.³ B01J 27/10
U.S. Cl. 502—224 8 Claims

1. A catalyst for the production of ethylene oxide by oxidation of ethylene, said catalyst comprising

(A) silver,

(B) (1) sodium in an amount of more than 1000 ppm (mg/kg of catalyst) based on the catalyst and (2) cesium as a cationic component, the amount of cesium being smaller than that of sodium and ranging from 10 ppm to 0.5% by weight based on the catalyst, and

(C) chlorine as an anionic component the amount of chlorine being from 5 ppm to 0.1% by weight based on the catalyst.

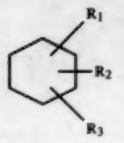
4,415,477

CATALYST FOR DEHYDROGENATION OXYGEN-CONTAINING DERIVATIVES OF THE CYCLOHEXANE SERIES INTO THE CORRESPONDING CYCLIC KETONES AND/OR PHENOLS

Alexandr Y. Rozovsky, Rublevskoe shosse, 97, korpus 3, kv. 25; Valentin D. Stytsenko, ulitsa Musy Dzhalilya, 34, korpus 2, kv. 18; Svetlana A. Nizova, ulitsa Volgina, 27, kv. 144; Petr S. Belov, ulitsa Vavilova, 52, korpus 3, kv. 163, and Alexandr J. Dyakonov, ulitsa Begovaya, 32, kv. 71, all of Moscow, U.S.S.R.

Filed Dec. 22, 1980, Ser. No. 219,170
Claims priority, application U.S.S.R., Dec. 27, 1979, 2852801; Dec. 27, 1979, 2852803
Int. Cl.³ B01J 23/78, 23/74, 27/02, 27/08
U.S. Cl. 502—178 2 Claims

1. A catalyst for dehydrogenating oxygen-containing derivatives of the cyclohexane series having the following general formula



where

R_1 is a radical selected from the group, containing hydrogen and alkyls C_1–C_4,

R_2 and R_3 are radicals selected from the group, containing —H, —OH, and =O but R_2 and R_3 cannot both be hydrogen;

R_1, R_2 and R_3 being linked to different carbon atoms of the ring, into the corresponding cyclic organic compounds selected from the group containing cyclic ketones and phenols, and mixtures thereof, said catalyst comprising an active component, -nickel, a promotor -tin, both as free metals, and an inert carrier selected from the group consisting of silica, diatomite, silicon carbide and magnesia, the amounts of said catalyst components being within the following limits as weight percent:

nickel—15 to 55

tin—0.2 to 1.95

inert carrier—84.8 to 43.05

and wherein the atomic ratio of nickel and tin lies within 26.6:1 and 410:1, respectively.

2. A catalyst as claimed in claim 1, also containing an alkali salt of a mineral acid in an amount of from 0.01 to 1.0 wt.%.

4,415,478

LOW HALIDE ACTIVATED AGGLOMERATED CARBON CATALYSTS

Robert M. Suggitt, Wappingers Falls; Joseph H. Coone, Jr., Fishkill, and Walter C. Gates, Jr., Carmel, all of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 754,394, Dec. 27, 1976, abandoned. This application Sep. 21, 1981, Ser. No. 304,231
Int. Cl.³ B01J 21/18; C01B 31/08; B01J 20/20, 23/40
U.S. Cl. 502—181 8 Claims

1. The method of preparing a reduced ash carbon agglomerate which comprises

leaching a high ash carbon agglomerate in contact with a hydrohalic acid thereby forming a reduced ash carbon agglomerate containing halide values;

leaching said reduced ash carbon agglomerate in contact with a solution containing at least one composition selected from the group consisting of water-soluble organic carboxylic acid and ammonium salts thereof thereby forming a reduced ash carbon agglomerate containing decreased halide values; and

recovering said reduced ash carbon agglomerate containing decreased halide values.

2. The method of preparing a reduced ash carbon agglomerate as claimed in claim 1 wherein said hydrohalic acid is hydrochloric acid.

3. The method of preparing a reduced ash carbon agglomerate as claimed in claim 1 wherein said hydrohalic acid is hydrofluoric acid.

4,415,479

PALLADIUM ON CARBON CATALYST FOR PURIFICATION OF CRUDE TEREPHTHALIC ACID

Imre Puskas, Glen Ellyn, and David E. James, Batavia, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 29, 1981, Ser. No. 316,336
Int. Cl.³ B01J 23/44; C07C 51/42
U.S. Cl. 502—85 18 Claims

10. A catalyst composition for purification of terephthalic

acid which comprises crystallites of catalytically active palladium adsorbed upon a porous carbonaceous support material comprising activated carbon granules having a surface area of at leat 600 m^2/g wherein said palladium crystallites are predominantly less than 35 angstroms (A) in longitudinal measurement and palladium content is less than 1.0 (wt)% of total catalyst weight, wherein said catalyst is prepared by adsorbing catalytically active palladium crystallites upon the surface of activated carbon granules by contacting said granules with an aqueous solution of an amine and a palladium salt in the presence of an organic carboxylic acid wherein concentration of said amine is sufficient to solubilize said palladium salt, and the mole ratio of said acid to amine is at least 0.75 wherein said palladium reacts with said carbon to produce said catalyst composition.

11. The composition of claim **10** wherein said palladium salt is selected from the group consisting of palladium chloride, palladium bromide, palladium iodide and palladium acetate.

12. The composition of claim **10** wherein said palladium salt is palladium chloride.

4,415,480

TRANSITION METAL OXIDE BRONSTED ACID CATALYSTS

Lawrence L. Murrell, South Plainfield, and Dane C. Grenoble, Plainfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1981, Ser. No. 305,266
Int. Cl.³ B01J *21/04, 23/20, 23/30*
U.S. Cl. 502—242 **17 Claims**

1. A solid acid catalyst having primarily Bronsted acidity which comprises at least one catalytic metal oxide selected from the group consisting of the oxides of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof supported on a support which comprises alumina.

4,415,481

PYRIDINE-MODIFIED NA X-TYPE OR LI X-TYPE ADSORBENT CHARACTERIZED BY ITS ABILITY TO SEPARATE PARA-XYLENE FROM C-8 AROMATIC HYDROCARBON MIXTURES

William Smolin, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 152,865, May 23, 1980, Pat. No. 4,351,981. This application Jun. 14, 1982, Ser. No. 378,466
Int. Cl.³ B01J *29/08*
U.S. Cl. 502—62 **3 Claims**

1. An adsorbent, characterized by its ability to separate high purity para-xylene from feed mixtures containing C-8 aromatic hydrocarbon including para-xylene, which comprises a sodium X-type or a lithium X-type zeolite, modified with a pyridine.

4,415,482

OXIDATION AND AMMOXIDATION CATALYST

Jerry R. Ebner, St. Charles, Mo., assignor to Monsanto Company, Del.

Filed Nov. 12, 1981, Ser. No. 320,403
Int. Cl.³ B01J *29/16, 21/02, 27/14, 27/02*
U.S. Cl. 502—205 **8 Claims**

1. A catalyst for oxidation and ammoxidation of hydrocarbons consisting essentially of catalytic elements having the empirical formula

$$BiMo_aV_bSb_cM_dO_x$$

wherein a is from 0.5 to 2, b is from 0.01 to 0.12, c is from 0.01 to 10, d is from 0 to 0.5, and x is taken to satisfy the valence requirements of the other elements present and wherein M is one or more elements selected from Groups I-A, II-A, III-A, V-A, VI-A, I-B, IV-B, VI-B and VII-B of the Periodic Table, said catalyst being prepared by forming a mixture containing a vanadium component, an antimony component, a hydrophilic bismuth molybdate component having the empirical formula.

$$BiMo_aO_x \cdot Y(H_2O)$$

wherein a is from 0.5 to 2, x is taken to satisfy the valence requirement of the other elements present and Y is a number such that the bound water is 5 to 40 weight percent of the total component forming said mixture into dry particles, and calcining at a temperature of from 500° to 850° C.

4,415,483

CLASS OF FRIEDEL-CRAFTS CATALYSTS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 191,855, Sep. 29, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 355,346
Int. Cl.³ B01J *29/00, 21/02, 27/02, 27/20*
U.S. Cl. 502—255 **1 Claim**

1. A catalyst for the aralkylation of aromatics to produce polybenzyls, manufacture of aromatic ketones, aromatic sulfones and aromatic esters wherein the catalyst is molybdenum silicide, having a particle size distribution of about 0.6 to 7.5 microns and a mean diameter of about 4.1 to 4.8 microns and a surface area of about 1.5 to 2 square meters per cubic centimeter.

4,415,484

AUTOTHERMAL REFORMING CATALYST

Herbert J. Setzer, Ellington; Roger R. Lesieur, Enfield, and Sam Karavolis, East Hampton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 26, 1982, Ser. No. 372,253
Int. Cl.³ B01J *21/04, 23/58*
U.S. Cl. 502—332 **2 Claims**

1. A high activity catalyst specifically adapted for substantially carbon-free use in an autothermal reformer comprising by weight about 0.01% to about 6% rhodium supported on an alumina substrate having deposited thereon about 10% to about 35% calcium oxide and in which the alumina substrate is promoted with magnesium oxide containing about 3% to about 15% magnesium.

4,415,485

PROCESS FOR THE INTERNAL COATING OF CONTACT TUBES

Carl Voigt, Rodenbach; Peter Kleinschmit, Hanau, and Reinhard Manner, Maintal, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,298
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034957
Int. Cl.³ B01J *35/02*
U.S. Cl. 502—100 **12 Claims**

1. A process for the internal coating of a contact tube with at least one catalyst comprising filling a substantially vertical contact tube with the catalyst material to be applied in flowable form, then simultaneously lowering the level of the liquid level in the contact tube and heating the liquid boundary surface in the tube.

4,415,486

RESISTIVE PASTE FOR A RESISTOR BODY

Alexander H. Boonstra; Cornelis A. H. A. Mutsaers, and Franciscus N. G. R. van der Kruijs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,365

Claims priority, application Netherlands, Jun. 11, 1981, 8102809

Int. Cl.³ H01B 1/02

U.S. Cl. 252—514 4 Claims

1. A resistive material suitable for the production of a resistor body consisting of a mixture of glass powder and a silver-palladium composition selected from the group consisting of a silver palladium rhodite compound of the formula $Ag_x P_{1-x} RhO_2$ wherein $0.05 \leqq x \leqq 0.15$, a mixture of alloys consisting of silver and palladium and said compound, and alloys consisting of silver and palladium the particles of which are coated with palladium rhodite of the formula $Pd\ RhO_2$.

4,415,487

BIS-BETAINES, A PROCESS FOR THEIR PREPARATION, AND CLEANING AGENTS CONTAINING THESE COMPOUNDS

Günter Blaschke, Winhöring; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

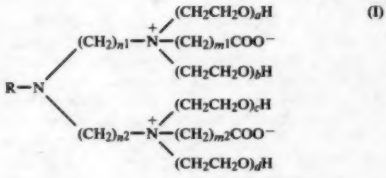
Filed Nov. 8, 1982, Ser. No. 439,729

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145733

Int. Cl.³ C07C 79/16; C11D 1/90, 7/32

U.S. Cl. 252—546 4 Claims

1. A bis-betaine of the formula



(I)

in which

R denotes a saturated or an olefinically unsaturated hydrocarbon radical which has 1 to 3 double bonds and 8 to 22 carbon atoms,

n^1 and n^2 represent an integer from 2 to 3, and n^1 and n^2 can be identical or different,

m^1 and m^2 represent an integer from 1 to 4, and m^1 and m^2 can be identical or different, and

a, b, c and d, which are identical or different, each is a number from 1 to 5, with the proviso that the sum (a+b+c+d) should be at most 10.

4,415,488

TRIAMINE-TRIOXIDES, A PROCESS FOR THEIR PREPARATION, AND CLEANING AGENTS CONTAINING THESE COMPOUNDS

Günter Blaschke, Winhöring; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

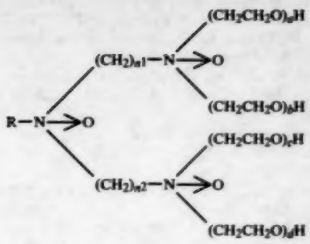
Filed Nov. 8, 1982, Ser. No. 439,731

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145735

Int. Cl.³ C07C 79/16; C11D 1/75, 7/32

U.S. Cl. 252—547 4 Claims

1. A triamine-trioxide of the formula



(I)

in which

R denotes a saturated or an olefinically unsaturated hydrocarbon radical which has 1 to 3 double bonds and 8 to 22 carbon atoms,

n^1 and n^2 represent an integer from 2 to 3, and n^1 and n^2 can be identical or different, and

a, b, c and d, which are identical or different, each is a number from 1 to 5, with the proviso that the sum (a+b+c+d) should be at most 10.

4,415,489

PROCESS FOR MAKING HIGH SOLIDS CONTENT ZEOLITE A-ALKYLBENZENE SULFONATE COMPOSITIONS SUITABLE FOR USE IN MAKING SPRAY DRIED DETERGENT COMPOSITIONS

Alexander P. Kiczek, Middletown; Leo A. Salmen, North Bergen, both of N.J., and Clark B. Tower, Oxford, N.Y., assignors to Colgate Palmolive Company, New York, N.Y.

Filed Apr. 6, 1979, Ser. No. 12,704

Int. Cl.³ C11D 1/22, 3/12, 11/04, 17/06

U.S. Cl. 252—558 5 Claims

1. A process for making a high solids content crystalline zeolite Type A or amorphous aluminosilicate zeolite-alkylbenzene sulfonate composition suitable for use in making spray dried detergent compositions, which comprises:

manufacturing said zeolite in an aqueous medium containing sodium hydroxide in solution therein;

separating a substantial proportion of the aqueous medium from said zeolite so as to produce zeolite particles containing excess sodium hydroxide solution on the particle surfaces, said zeolite particles having an ultimate particle size of from about 0.1 to 12 microns;

neutralizing said excess sodium hydroxide solution with aqueous linear higher alkylbenzene sulfonic acid in excess of the amount needed to neutralize said sodium hydroxide on the zeolite particle surfaces and occluded therein; and

adding a second portion of sodium hydroxide in an amount sufficient to neutralize said excess amount of linear higher alkylbenzene sulfonic acid and produce additional sodium linear alkylbenzene sulfonate in the resulting composition.

4,415,490

NON-THROMBOGENIC MATERIAL

Yasushi Joh, Yokohama, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1979, Ser. No. 60,054

Int. Cl.³ C08L 5/10; C08B 37/10

U.S. Cl. 525—54.2 11 Claims

1. A non-thrombogenic material comprising an aldehyde group-containing polymer bonded directly with heparin in which at least one hydroxyl group of said heparin is covalently bonded to one aldehyde group of said polymer through only one acetal bond or hemiacetal bond at each bonding site between said heparin and said polymer.

4,415,491

SYNTHETIC VACCINE PEPTIDE EPITOMES OF HEPATITIS B SURFACE ANTIGEN

Girish N. Vyas, Orinda, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 14, 1980, Ser. No. 112,054

Int. Cl.³ A61K *37/02, 39/29;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **9 Claims**

1. An oligopeptide of the formula

H-TYR-PRO-SER-CYS-CYS-CYS-THR-LYS-PRO-THR-ASP-GLY-ASN-OH; or

H-TYR-PRO-SER-CYS-CYS-CYS-THR-LYS-PRO-SER-ASP-GLY-ASN-OH; or

H-PHE-PRO-SER-CYS-CYS-CYS-THR-LYS-PRO-THR-ASP-GLY-ASN-OH; or

H-PHE-PRO-SER-CYS-CYS-CYS-THR-LYS-PRO-SER-ASP-GLY-ASN-OH.

4,415,492

LYSINE POLYMERS WHICH MAY BE USED AS SUPPORTS FOR THE PREPARATION OF PRODUCTS OF DIAGNOSIS AND PRODUCTS OBTAINED

Alain L. de Weck, Institut für klinische Immunologie, Bern, Switzerland (3010); Conrad H. Schneider, and Hans P. Rolli, both of Bern, Switzerland, assignors to Alain L. de Weck and Institut fur Immunologie Inselspital, both of Bern, Switzerland

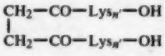
Filed Aug. 13, 1981, Ser. No. 292,358

Claims priority, application France, Aug. 29, 1980, 80 18809

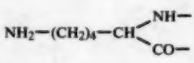
Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **2 Claims**

1. A lysine polymer of the formula:



where each n' is the same whole number, said number being between 4 and 10, and Lys has the formula:



4,415,493

IMMUNE MODULATOR PEPTIDES

William O. Weigle, Del Mar, and Edward L. Morgan, San Diego, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed May 11, 1982, Ser. No. 377,223

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **17 Claims**

1. Compound having the formula H-Thr-Ile-Ser-Lys-Ala-Lys-Gly-Gln-Pro-Arg-Glu-Pro-Gln-Val-Tyr-Thr-Leu-Pro-Pro-Ser-Arg-Glu-Glu-Hse in which Hse is homoserine or homoserine lactone.

4,415,494

WATER-INSOLUBLE MONOAZO DYESTUFFS, THEIR MANUFACTURE AND THEIR USE

Ulrich Bühler, Schöneck; Rudolf Löwenfeld, Dreieich; Uwe Kosubek, Büttelborn, and Maria Kallay, Königstein, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

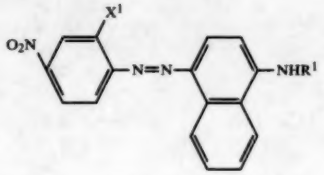
Filed Mar. 19, 1981, Ser. No. 245,630

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011178

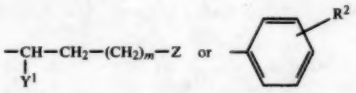
Int. Cl.³ C07C *107/00, 107/06, 107/08;* **C09B** *29/00*

U.S. Cl. 260—196 **7 Claims**

1. Monoazo dyestuff free from moieties imparting solubility in water and having the formula



wherein X^1 is nitro, cyano or methylsulphonyl and R^1 is of the formula



wherein Y^1 is hydrogen, methyl or ethyl;

Z is phenyl, cyano, phenoxy, phenoxy substituted by alkyl having 1 to 4 carbon atoms, phenoxy substituted by alkoxy having 1 to 4 carbon atoms, halogen substituted phenoxy, alkoxy having 1 to 4 carbon atoms, cyano substituted alkoxy having 1 to 4 alkoxy carbon atoms, alkoxy of 1 to 4 carbon atoms substituted by alkoxy having 1 to 4 carbon atoms,

R^2 is hydrogen, alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms; and

m is a number from 0 to 2.

4,415,495

5,6;8,9-TETRAHYDRO-7H-DIBENZ(D,F)AZONINES

Gerhard Satzinger, Denzlingen; Manfred Herrmann; Edgar Fritschi, both of St. Peter; Heinrich Bahrmann, Kirschzarten; Volker Ganser, Freiburg; Bernd Wagner, Denzlingen, and Wolfgang Steinbrecher, Gundelfingen, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Freiburg, Fed. Rep. of Germany

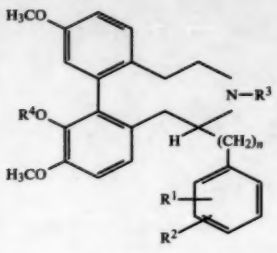
Filed Feb. 24, 1981, Ser. No. 238,501

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3007710

Int. Cl.³ C07D *225/08;* **A61K** *31/355*

U.S. Cl. 260—239 D **20 Claims**

1. 5,6;8,9-Tetrahydro-7H-dibenz(d,f)-azonine compounds of the formula:



wherein R^1 and R^2, which are the same or different, are hydrogen, halogen or lower alkyl or alkoxy wherein lower alkyl and alkoxy are straight chained or branched having 1 to 3 carbon atoms R^3 is a hydrogen atom or a lower alkyl; R^4 is a hydrogen atom or a lower alkyl or alkanoyl and n is 1 or 2; wherein lower alkyl, alkanoyl and alkoxy are straight chained or branched having 1 to 5 carbon atoms; and the pharmaceutically acceptable salts thereof with the proviso that R^1, R^2, R^4 are not all hydrogen when n is 1 and R^3 is methyl.

4,415,496

BICYCLIC LACTAMS

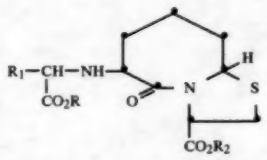
Elbert E. Harris; Arthur A. Patchett, both of Westfield; Edward W. Tristram, Watchung; Eugene D. Thorsett, Fanwood, and Matthew J. Wyvratt, Jr., Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 246,492, Mar. 23, 1981, abandoned. This application Feb. 19, 1982, Ser. No. 348,811

Int. Cl.³ C07D *513/04*

U.S. Cl. 260—239.3 B **29 Claims**

1. A compound of the formula:



I

wherein:

R and R_2 are independently hydrogen, loweralkyl, aryl, and aryl lower alkyl;

R_1 is

hydrogen;

alkyl, alkenyl, alkynyl, and unsubstituted cycloalkyl of from 1 to 12 carbon atoms;

substituted lower alkyl wherein the substituent can be halo, hydroxy, carboxy, lower alkylthio, lower alkoxy, lower alkoxy carbonyl, aryl lower alkoxy carbonyl, amino, lower alkylamino, diloweralkylamino, acetylamino, or benzoylamino;

substituted lower alkyl having the formula $R_A(CH_2)_n$—Q—$(CH_2)_m$ wherein n is 0–2, m is 1–3, R_A is aryl or heteroaryl optionally substituted by amino, diloweralkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, amino lower alkyl, trihaloloweralkyl, cyano, nitro, sulfonamido, benzoyl, 1-naphthoyl, lower alkyl, halo, dihalo, and lower alkoxy, and Q is O, S, N—R_B, $CONR_C$, NR_CCO, CH=CH wherein R_B is hydrogen, lower alkyl, aryl, aryl lower alkyl, lower alkanoyl, benzoyl, or 1-naphthoyl, and R_C is hydrogen or lower alkyl;

aryl;

substituted aryl wherein the substituent is lower alkyl, amino loweralkyl, loweralkoxy, aryloxy, benzoyl, or 1-naphthoyl, hydroxy, halo, or dihalo;

aryl lower alkyl or heteroaryl loweralkyl which include branched lower alkyl groups; substituted aryl lower alkyl or substituted heteroaryl loweralkyl which include branched lower alkyl groups wherein the lower alkyl groups can be substituted by amino, acetylamino, benzoylamino, or hydroxyl and the aryl and heteroaryl groups can be substituted by halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, benzoyl, 1-naphthoyl, arylthio, amino, amino lower alkyl, lower alkanoyl amino, benzoylamino, 1-naphthoylamino, diloweralkylamino, lower alkylamino, hydroxy, hydroxy loweralkyl, trihalo loweralkyl, nitro, cyano, or sulfonamido; and,

the pharmaceutically acceptable salts thereof, wherein in said R, R_1 and R_2 groups, the aryl is selected from the group consisting of phenyl, naphthyl, or biphenyl; and, the heteroaryl is selected from the group consisting of indolyl, thienyl, imidazolyl, furyl, benzimidazolyl, pyridyl, quinolinyl, isoquinolinyl, and benzothienyl.

4,415,497

PROCESS FOR PRODUCING AN ANTIBIOTIC

Masahito Nakayama, Higashi-Yamato; Shigeru Kimura, Tachikawa; Toshimi Mizoguchi, Higashi-Murayama; Sohei Tanabe, Higashi-Murayama, and Toshihito Mori, Higashi-Murayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

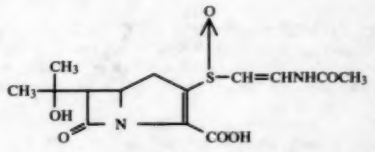
Filed Aug. 26, 1981, Ser. No. 296,306

Claims priority, application Japan, Sep. 5, 1980, 55-123087

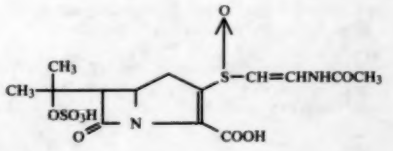
Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.2 T **1 Claim**

1. A process for producing an antibiotic KA-6643-A or a pharmaceutically acceptable salt thereof represented by the formula (I):



which comprises hydrolyzing an antibiotic KA-6643-B represented by the formula (II):



wherein said hydrolysis is carried out in an aqueous buffer solution at a pH in the range of from 6.0 to 7.0, at a temperature in the range of from room temperature to 100° C. and for a time of from 1 to 10 hours.

4,415,498

SYNTHESIS OF DAUNOMYCINONE AND THE DERIVATIVES THEREOF

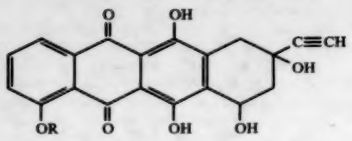
Lakshminarayan Anathasubramanian, Brookline; T. Ross Kelly, Watertown, and Jacob Vaya, Brookline, all of Mass., assignors to Research Corporation, New York, N.Y.

Filed Nov. 7, 1979, Ser. No. 91,897

Int. Cl.³ C07C *49/72, 49/73*

U.S. Cl. 260—351.1 **16 Claims**

1. A compound of the formula:



wherein R is an alkyl group containing up to five carbon atoms.

4,415,499

PROCESS FOR THE MANUFACTURE OF PALLADIUM(II) CATALYST AND FOR THE MANUFACTURE OF ALKENYL ESTERS OF CARBOXYLIC ACIDS EMPLOYING SAID CATALYST

Klaus Blum, and Rudolf Strasser, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 6, 1981, Ser. No. 309,006

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047347

Int. Cl.³ C11C *3/02*

U.S. Cl. 260—410.9 N **4 Claims**

1. In a process for the manufacture of alkenyl esters of carboxylic acids, the improvement comprising:

reacting a carboxylic acid with an alkenyl ester of a lower carboxylic acid, in the presence of a supported catalyst comprising a support material comprising activated carbon having an analytical SiO_2 content of from 0.5 to 8% by weight and a catalyst impregnated in said support material comprising a palladium(II) salt.

4,415,500

CATALYST COMPRISING A COMPLEX OF AN ELONGATED ORGANIC MOIETY AND A METAL ION

Joost Manassen, Rehovot, and Yaakov Dror, Tel Aviv, both of Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Mar. 3, 1981, Ser. No. 240,116

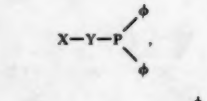
Claims priority, application Israel, Mar. 14, 1980, 59647

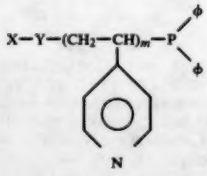
Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **5 Claims**

1. A catalyst for use in homogeneous catalysis at the interface of an aqueous phase and an organic phase, said catalyst having surface active properties and including means for maintaining the catalyst in said aqueous phase, said catalyst comprising

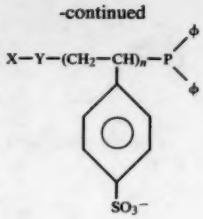
a complex of an elongated organic moiety and a metal ion, said elongated organic moiety having a structure selected from the group consisting of





and

-continued



wherein X is a polar moiety which comprises a hydrophilic group and Y is a backbone of at least 5 carbon atoms chain length, ϕ is a phenyl radical and m and n are integers,

the ligand moiety of said elongated organic moiety forming a complex with said metal ion and which metal ion is selected from the group consisting of rhodium, ruthenium, iridium, platinum, palladium and cobalt.

4,415,501

ALKENYLZIRCONIUM REAGENTS USEFUL FOR PROSTAGLANDIN ANALOG SYNTHESIS

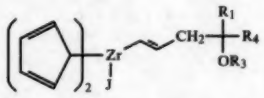
Charles V. Grudzinskas, Upper Nyack, N.Y., and Guenter W. Nachtigall, Georgetown, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 16, 1981, Ser. No. 331,373

Int. Cl.³ C07F *7/00*

U.S. Cl. 260—429.3 **27 Claims**

1. A compound of the formula:



wherein J is bromo or chloro, R_1 is methyl, ethyl, 1-propenyl, vinyl or cyclopropyl; R_4 is an alkyl radical of 2–7 carbon atoms and R_3 is a hydroxyl-protecting group.

4,415,502

POLYCARBONATE TYPE NONIONIC SURFACTANTS

John F. Timberlake; Daniel W. Baugh, Jr., both of Baton Rouge, and Bobby Burkes, New Orleans, all of La., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 177,030, Aug. 11, 1980, Pat. No. 4,330,481, which is a division of Ser. No. 973,211, Dec. 26, 1978, abandoned. This application Dec. 4, 1981, Ser. No. 327,375

Int. Cl.³ C07C *69/96*

U.S. Cl. 260—463 **7 Claims**

1. A process for the preparation of polycarbonate type surfactants comprising the steps of: (a) reacting ethylene carbonate and monohydroxy alcohol in the presence of an alkali metal salt catalyst at a temperature of about 130° C. to about 210° C. to form a reaction product, a (b) further reacting the reaction product of step (a) with ethylene oxide.

4,415,503

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

Jeffrey D. Robbins, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

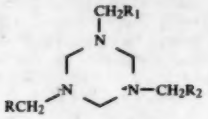
Filed Sep. 28, 1982, Ser. No. 424,941

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 F **8 Claims**

1. A method for the preparation of N-phosphonomethylglycine which comprises the steps of:

(a) reacting 1,3,5-tri-(substituted methyl)hexahydro-s-triazine, a compound of the formula



wherein R, R_1 and R_2 are the same or different and are selected from the group consisting of cyano, alkoxycarbonyl wherein the alkyl group contains from 2 to 18 carbon atoms, and aryloxycarbonyl wherein the aryl group ranges from 6 to 12 carbon atoms, with a substituted phosphorus compound having the formula PXYZ wherein X is a halogen, Y and Z are each independently selected from the group consisting of halogen, alkoxy having from 1 to 10 carbon atoms and aryloxy, in the presence of a low molecular weight carboxylic acid solvent and a protic acid;

(b) treating the reaction mixture with water;

(c) removing said solvent and hydrolyzing the residue to generate a salt of N-phosphonomethylglycine; and

(d) neutralizing said salt to produce the end product, N-phosphonomethylglycine.

4,415,504

P-HYDROXYPHENYLGLYCINE.α-PHENYLETHANESULFONATE, PROCESS FOR PRODUCTION THEREOF AND UTILIZATION THEREOF IN RESOLUTION OF P-HYDROXYPHENYLGLYCINE

Ichiro Chibata, Suita; Shigeki Yamada, Toyonaka; Chikara Hongo, Osaka, and Ryuzo Yoshioka, Kaizuka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Sep. 9, 1982, Ser. No. 416,338

Claims priority, application Japan, Sep. 21, 1981, 56-150047; Sep. 21, 1981, 56-150048

Int. Cl.³ C07C *143/26*

U.S. Cl. 260—501.12 **32 Claims**

1. p-Hydroxyphenylglycine.α-phenylethanesulfonate.

6. A process for producing the optically active p-hydroxyphenylglycine.optically active α-phenylethanesulfonate which comprises reacting DL-p-hydroxyphenylglycine with optically active α-phenylethanesulfonic acid to form two diastereomers of the optically active p-hydroxyphenylglycine.optically active α-phenylethanesulfonate one of which being the easily soluble diastereomer and the other of which being the slightly soluble diastereomer, crystallizing the slightly soluble diastereomer and collecting the crystallized slightly soluble diastereomer.

4,415,505

PROCESS FOR MAKING ALKYL OR ARYLTHIOPHOSPHONIC ACID

Werner Krause, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

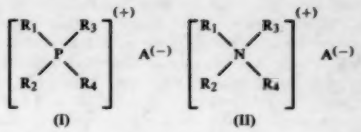
Filed Jul. 22, 1982, Ser. No. 400,892

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131249

Int. Cl.³ C07F *9/42*

U.S. Cl. 260—543 P **7 Claims**

1. In the process for making alkyl or arylthiophosphonic acid dichlorides by reacting alkyl or aryldichlorphosphanes with at least stoichiometric proportions of sulfur at a temperature above the melting point of sulfur and in the presence of a catalyst, and separating the resulting alkyl or arylthiophosphonic acid dichloride from the reaction mixture after the reaction is terminated, the improvement which comprises: effecting the reaction at a temperature between the melting point of sulfur and the boiling point of the resulting alkyl or arylthiophosphonic acid dichloride and in the presence of a catalyst of the following general formula I or II



(I) (II)

in which R_1, R_2, R_3 and R_4 stand for identical or different alkyl, aryl, alkaryl or aralkyl groups having from 1 to 22 carbon atoms and A stands for the anionic group of an organic or inorganic acid, the catalyst being used in a proportion of 0.01 up to 5 weight %, based on the quantity of the phosphane component; terminating the reaction and separating the alkyl or arylthiophosphonic acid dichloride from the reaction mixture; and using resulting catalyst-containing residue in further reactions of alkyl or aryldichlorophosphanes with sulfur.

4,415,506

TREATING THE RESIDUE FROM THE PRODUCTION OF PHOSPHOROCHLORIDOTHIONATES

Mark S. Carron, Spring Valley; Ronald S. La Barbera, New City; Lester P. Van Brocklin, Thiells, all of N.Y., and Pawan K. Jain, Norwood, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 193,247, Oct. 2, 1980, Pat. No. 4,356,130. This application May 27, 1982, Ser. No. 382,832

Int. Cl.³ C07F *9/20*

U.S. Cl. 260—986 **10 Claims**

1. A method for treating the distillation residue from the production of dialkyl and diaryl phosphorochloridothionates comprising:

(a) mixing the hot residue with a sufficient amount of a separating solution having a specific gravity to cause a three phase mixture to form comprised of an organic phase, a separating solution phase and a sulfur phase,

(b) recovering an organic phase which is of a lower specific gravity than the separating solution phase; and

(c) drying and chlorinating the separated organic phase to recover additional phosphorochloridothionate product.

4,415,507

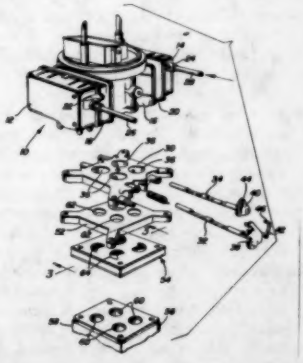
MIXING VALVE FOR DUAL FUEL CARBURETOR AND METHOD OF DUAL CHARGE MIXING PERFORMED THEREBY

Elmer A. Voliva, P.O. Box 542, Midland, Tex. 79702

Filed Jan. 6, 1982, Ser. No. 337,477

Int. Cl.³ F02M *43/00*

U.S. Cl. 261—18 B **13 Claims**



1. For use in conjunction with a dual charge forming appara-

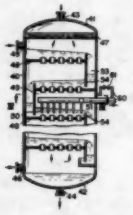
tus of the type including a pair of charge flow passages having outlet ends for registry and communication with the inlet ends of a pair of combustion engine charge induction passages, a dual charge mixing apparatus defining a pair of flow paths extending therethrough and including inlet and outlet ends for registry and communication with said outlet ends of said charge flow passages and said inlet ends of said induction passages, respectively, said charge mixing apparatus including flow diverting means, intermediate said inlet and outlet ends of said flow paths, operable to divert generally the same proportion of the charge flowing through each of said flow paths into the other flow path for admixing with the non-diverted portion of the charge flowing therethrough.

4,415,508

APPARATUS FOR MIXING GASES

Kenji Aida, Yokosuka; Takeshi Yamamoto, Tokyo, and Toshihiko Kumazawa, Yokohama, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

Division of Ser. No. 953,568, Oct. 23, 1978, Pat. No. 4,256,604. This application Oct. 14, 1980, Ser. No. 196,935
Claims priority, application Japan, Oct. 26, 1977, 52-127646
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—114 R **12 Claims**



1. An apparatus for mixing a hydrocarbon-containing gas flow with a molecular oxygen-containing gas flow comprising

a cylindrical main body;

an exit and an inlet for the hydrocarbon-containing gas flow provided respectively to the upper and the lower portions of said cylindrical main body;

an inlet and an exit for an aqueous medium provided respectively to the upper and the lower portions of said main body;

at least one aqueous medium residence means provided on the inlet side of the hdyrocarbon-containing gas flow in the main body and allowing said gas flow to pass therethrough in connection with said aqueous medium;

at least one shielding means for flame propagation provided on the discharge side of said hydrocarbon-containing gas flow in the main body and allowing said gas flow to pass therethrough; and

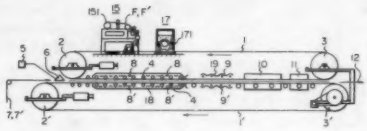
an introduction means for the molecular oxygen-containing gas flow provided in a gas mixing chamber formed in a space defined by said residence means and said shielding means connected to a plurality of bundles of pipes each having at least one orifice at the end, the orifices of said bundles of pipes are immersed in the layer of the aqueous medium on the aqueous medium residence means.

4,415,509

ACRYLIC LAMINATED DIFFUSER PANEL HAVING HIGH LIGHT-DIFFUSING PROPERTY AND PROCESS FOR PREPARING SAME

Yasuo Toyooka, Tokyo; Kunio Ohnishi, Toyama; Kozo Ida, Toyama, and Toyokazu Ego, Toyama, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,111
Int. Cl.³ B29D *7/14*
U.S. Cl. 264—1.3 **15 Claims**



1. A process for the preparation of acrylic laminated diffuser panels having a high light-diffusing property, which process comprises the successive steps of:

(1) laminating an acrylic resin, particle-containing film having a high light-diffusing property onto the molding surface of at least one of a pair of casting mold parts, wherein said light diffusing particles are incorporated in an amount such that the parallel ray percent transmission of the finished acrylic diffuser panel is not greater than about 60%,

(2) casting an acrylic monomer or its partially polymerized product into a space between said pair of casting mold parts, and then,

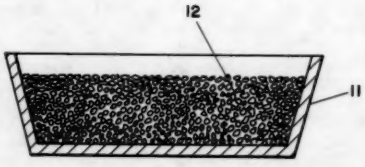
(3) polymerizing said acrylic monomer of said partially polymerized product, thereby causing the acrylic resin film to become integrated with and laminated onto the resulting acrylic resin plate.

4,415,510

PROCESS FOR MAKING OXIDE REFRACTORY MATERIAL HAVING FINE CRYSTAL STRUCTURE

Wesley Q. Richmond, Stevensville, Canada, assignor to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 153,302, Jun. 15, 1971, abandoned. This application Dec. 12, 1972, Ser. No. 314,319
Int. Cl.³ B22D *23/08*
U.S. Cl. 264—8 **8 Claims**



8. A process for making fusion cast metal oxides comprising pouring a molten mass of metal oxide into a mold containing metal cooling-spheres thereby causing the molten mass to rapidly cool and solidify in the interstices between the metal cooling-spheres.

4,415,511
ROTARY ATOMIZING PROCESS

Romeo G. Bourdeau, Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,190
Int. Cl.³ B01J 2/02
U.S. Cl. 264—8 16 Claims

1. In the process of producing metal powder by pouring a liquid metal onto the surface of a spinning disk at a temperature at least 200° F. higher than its liquidus temperature, the steps of:

forming a coating on the disk of a compound C which is stable during the process and which comprises said metal if said metal is unalloyed and which, if said metal is an alloy, comprises the base metal of said alloy, wherein said compound has a melting point at least 50° F. higher than the pour temperature of the liquid metal, and wherein said liquid metal can coexist with said compound at the pour temperature of the liquid metal;

pouring a liquid stream of the said metal to be formed into a powder onto the coated, spinning disk at said pour temperature wherein coupling of said metal with the compound C occurs and a stable skull of said metal forms over the coating and fine liquid droplets of said metal are formed as said metal is flung off the disk;

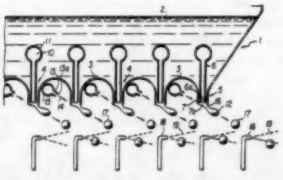
cooling the liquid metal droplets after they leave the disk surface to solidify the droplets; and

collecting the solidified droplets.

4,415,512
METHOD AND APPARATUS FOR PRODUCING HOLLOW METAL MICROSPHERES AND MICROSPHEROIDS

Leonard B. Torobin, Materials Technology Corp., 4174 148th Ave. NE., Redmond, Wash. 98052

Continuation-in-part of Ser. No. 103,361, Dec. 13, 1979, Pat. No. 4,303,732, and Ser. No. 103,114, Dec. 13, 1979, Pat. No. 4,303,730, each is a division of Ser. No. 59,297, Jul. 20, 1979, abandoned. This application Mar. 18, 1981, Ser. No. 245,137
Int. Cl.³ C03B 19/10
U.S. Cl. 264—9 33 Claims

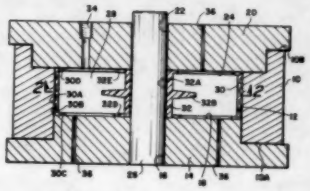


1. A method for making hollow metal microspheres from a film forming metal material which comprises heating said material, forming a liquid film of said material across an orifice, applying a blowing gas at a positive pressure on the inner surface of the liquid film to blow the film and form the microsphere, subjecting the microsphere during its formation to an external pulsating or fluctuating pressure field having periodic osciallations, said pulsating or fluctuating pressure field acting on said microsphere to assist in its formation and to assist in detaching the microsphere from said orifice.

4,415,513
METHOD OF MANUFACTURING A COMPOSITE FOAM TAPE TRANSPORT CAPSTAN

Ivo T. Plachy, San Mateo, Calif., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Division of Ser. No. 44,100, May 31, 1979, Pat. No. 4,280,646. This application Jan. 15, 1981, Ser. No. 225,262
Int. Cl.³ B29D 27/00
U.S. Cl. 264—45.4 2 Claims



1. A method of manufacturing a tape transport capstan comprising:

positioning a tubular outer rim in a cylindrical cavity mold, the internal diameter of the mold being equal the exterior diameter of the rim, the mold having an end surface perpendicular the cavity axis and having a cylindrical shaft extending from the end surface axially of the mold cavity;

inserting a hub having an axial opening therein onto said shaft and within the mold cavity, the hub having an internal radially extending non-circular portion, such portion being spaced intermediate the hub ends and extending towards said tubular outer rim;

closing the mold cavity with an end cap providing a second end surface parallel to and spaced from the mold cavity end surface;

filling the mold cavity having the rim and hub therein with foam plastic material;

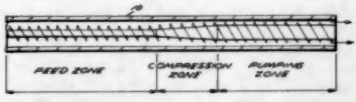
allowing the foam plastic material within the mold to solidify; and

removing the contents of the mold in which the hub, rim, and solidified foam plastic are bound into a unitary device.

4,415,514
METHOD FOR THE PREPARATION OF RIGID POLYVINYL CHLORIDE FOAMS

Antoon Dorrestijn, Grevenbicht; Pieter J. Lemstra, Brunssum, and Lambert H. T. van Unen, Heerlen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 22, 1981, Ser. No. 256,667
Claims priority, application Netherlands, Apr. 26, 1980, 8002463; Apr. 26, 1980, 8002464
Int. Cl.³ B29D 27/00
U.S. Cl. 264—53 8 Claims



1. Process for preparing polyvinyl chloride foams having densities below 200 kg/m³ by foaming rigid PVC containing a melt-flow improver in the presence of a blowing agent in an extruder comprising the combination of steps of:

(a) preparing a pre-granulate by mixing rigid PVC with 0.1 parts by weight to 15 parts by weight per 100 parts by weight of PVC of a melt-flow improver, said improver consisting of one or more compounds selected from the group consisting of:

(i) copolymers obtained by copolymerizing 10 to 90% by

weight of styrene and/or derivatives of styrene with 90 to 10% by weight of acrylonitrile and/or methacrylonitrile;

(ii) polystyrene or copolymers of styrene;

(iii) graft copolymers obtained by polymerizing 50 to 80 parts by weight of a mixture of monomers consisting of 30 to 40 parts by weight of acrylonitrile and 60 to 80 parts by weight of styrene in the presence of 20 to 50 parts by weight of rubber;

(iv) poly-ε-caprolactone;

(v) polyvinylacetate which may be solvolized;

(vi) homo- or copolymers of alkyl methacrylates having an alkyl group of 1 to 10 carbon atoms;

(b) feeding said pre-granulate to an extruder;

(c) extruding said pre-granulate to form a substantially homogeneous and substantially completely gelled granulate particles having an average diameter of 0.5 mm to 5 mm;

(d) impregnating said granulate with a physical blowing agent by heating said granulate in the presence of about 25 parts by weight to about 400 parts by weight of said physical blowing agent per 100 parts by weight of PVC at a pressure of 0.5 MPa to 5 MPa at 300° K. to 450° K. for about 0.5 hour to 40 hours;

(e) separating said impregnated granulate from the remaining blowing agent;

(f) foam extruding said impregnated granulate to form a rigid PVC foam whereby during extrusion said granulate passes through a temperature profile comprising at least:

(i) a first zone having a temperature of 350° K. to 400° K.;

(ii) a second zone having a temperature of 400° K. to 460° K.; and

(iii) a third zone having a temperature of 340° K. to 400° K.

4,415,515

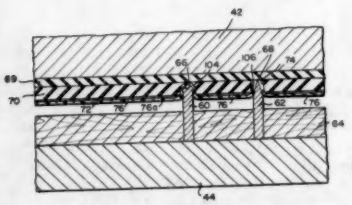
METHOD AND APPARATUS FOR SCORING PLASTIC SHEET MATERIAL

Benjamin Rosenberg, 2044 E. 13th St., Brooklyn, N.Y. 11229

Filed Apr. 6, 1982, Ser. No. 366,058

Int. Cl.³ B29C *19/02*

U.S. Cl. 264—68 **19 Claims**



1. A method for forming a container blank having cut edges and flexible score lines, comprising the steps of:

providing a thermoplastic sheet capable of being formed into said container blank,

providing at least one scoring tool member and an elastomeric make-ready member having a flat surface,

bringing said members to an inoperative position in which said members face each other and are spaced apart,

inserting said thermoplastic sheet between said members,

bringing said members together to an operative position in which said scoring tool member engages a face of said thermoplastic sheet and presses the engaged portion of said sheet against the flat surface of said make-ready member under substantial pressure, whereby said sheet adheres to said elastomeric make-ready member at the interface area with said scoring tool,

vibrating one of said members while maintaining the other member stationary to provide a rapid reciprocating movement between the scoring tool member and the engaged interface portion of said thermoplastic sheet in a direction parallel to the face of said thermoplastic sheet, said reciprocating movement being sufficient to generate frictional heat of an intensity to soften said engaged sheet portion and cause the latter to penetrate deep into said elastomeric make-ready, whereby to form a flexible score line which is intended into one face of said sheet and projects from the opposite face thereof, and

separating said members to their inoperative position and allowing said sheet to cool while maintaining it in substantially flat condition.

4,415,516

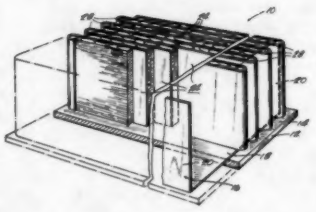
METHOD AND APPARATUS FOR MAKING ALIGNED FLAKE COMPOSITE WOOD MATERIAL INCLUDING INTEGRAL BAFFLES

Gordon P. Krueger, Hancock, and Anders E. Lund, Houghton, both of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Apr. 5, 1982, Ser. No. 365,634

Int. Cl.³ D04M *1/16*

U.S. Cl. 264—112 **12 Claims**



1. An apparatus for forming a loosely felted mat of elongated wood flakes, the mat including a longitudinal axis and the wood flakes being aligned in mutually parallel relation and parallel to the longitudinal axis of the mat, the apparatus comprising:

means defining a caul plate adapted to support wood flakes thereon, said caul plate having spaced apart elongated sides,

means for restraining wood flakes deposited on said caul plate, said restraining means including sidewalls extending vertically upwardly from said sides,

means for causing elongated wood flakes being deposited on said caul plate to be aligned in mutually parallel relation and parallel to said side walls and to maintain said elongated wood flakes in such parallel relation as additional flakes are deposited and as said caul is moved to a press, said means for aligning including a plurality of baffles supported in closely spaced mutually parallel relation between said sidewalls, said baffles defining parallel vertical planes parallel to said sidewalls, and said baffles being adapted to form a portion of the loosely felted mat and to be removed with the mat when the caul is removed to a press, and

means for releasably supporting said opposite ends of said baffles.

4,415,517

METHOD AND APPARATUS FOR SHAPING FIBER MATS

Donny L. Timms, Cleburne, Tex., assignor to Manville Service Corporation, Denver, Colo.

Filed Jul. 31, 1981, Ser. No. 288,964

Int. Cl.³ D04H *1/16*; B28B *7/14*

U.S. Cl. 264—118 **10 Claims**

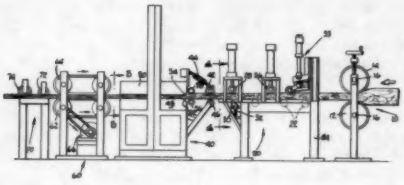
1. A method of forming an uncured fibrous mat which con-

tains a thermosetting binder throughout into a desired shape, said mat having upper and lower face surfaces and intermediate edge surfaces, said method comprising the steps of:

(a) subjecting the uncured mat of loose fibers to a first compressive force substantially along the entirety of both said upper and lower face surfaces while applying heat to said face surfaces to partially cure said thermosetting binder in the region of said face surfaces producing a mat of generally uniform cross section;

(b) longitudinally slitting at least one of said partially cured face surfaces to cut fibers in said partially cured mat which extend generally transverse to said mat and to said slit;

(c) subjecting the partially cured mat to a second compressive force substantially along the entirety of both said upper and lower face surfaces while applying additional heat to complete curing of the binder to complete the forming of said mat into the desired shape, said second compressive force having a greater magnitude in the vicinity of said at least one slit to reduce the mat thickness a greater amount in that region providing the mat with a



nonuniform cross section, said slit eliminating the adherence of the surface fibers caused by the partial cure, thereby reducing the tendency of the mat to return to said uniform cross section.

6. Apparatus for forming and shaping an uncured fibrous mat having upper and lower face surfaces and intermediate edge surfaces, said apparatus comprising a first means to compress said upper and lower face surfaces of the uncured mat of loose fibers, which contains a thermosetting binder throughout, while simultaneously heating said face surfaces to partially cure said binder in the region of said face surfaces; slitting means to longitudinally sever at least one of said partially cured face surfaces in at least one place to cut fibers therein extending generally transverse to said mat; a second means to compress and heat said upper and lower face surfaces to complete the curing of said thermosetting binder throughout the mat, said second means compressing the mat in the vicinity of said at least one slit a greater amount, said slit reducing the tendency of said mat in its vicinity to resist the additional compression.

4,415,518

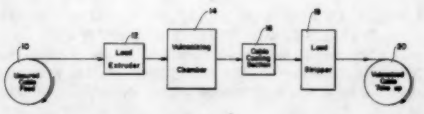
CONTINUOUS CURING OF CABLE

Gerald M. Pochurek, 711 Jersey St., W. Deal, N.J. 07712, and Ronald J. Keilly, 825 Martin Ave., Oradell, N.J. 07649

Filed Dec. 21, 1981, Ser. No. 332,538

Int. Cl.³ B29D *7/02*

U.S. Cl. 264—166 **7 Claims**



1. Process for continuously curing an elastomeric jacket on a cable comprising

continuously linearly passing a cable having an uncured elastomeric jacket thereon, encased within an outer layer temporary mold of heat conductive metallic material of substantially minimumly sufficient encasing layer thickness for protectively structurally confining and supporting therewithin the elastomeric jacket and cable thereat, through a vulcanizing zone maintained at substantially atmospheric pressure and provided with a heat transfer bath,

applying the bath to the cable at a selective bath temperature sufficient for vulcanizing the mold encased elastomeric jacket in situ during passage of the cable through the zone whereby to vulcanize the elastomeric jacket in situ substantially free from stress and in turn from damage to the integrity of and from disturbance of the disposition and volume of the elastomeric jacket, and

recovering from the zone the resultant cable having the mold encased vulcanized elastomeric jacket thereon.

4,415,519

METHOD OF MAKING POLYVINYLIDENE FLUORIDE-THERMOPLASTIC RESIN LAMINATES

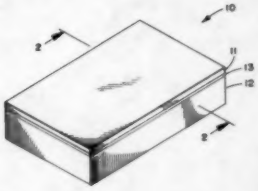
Albert Strassel, Oullins, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Division of Ser. No. 71,675, Aug. 31, 1979, Pat. No. 4,317,860. This application Jul. 30, 1981, Ser. No. 288,662

Claims priority, application France, Sep. 25, 1978, 78 27361; May 22, 1979, 79 12952

Int. Cl.³ B29D *7/02*; **B32B** *7/12*

U.S. Cl. 264—171 **5 Claims**



1. The method of making a unitary shaped laminate comprising at least one external layer of a polyvinylidene fluoride resin, a layer of a thermoplastic resin incompatible with polyvinylidene fluoride, and a layer of polyalkyl methacrylate resin intermediate and firmly adhered to said polyvinylidene fluoride and thermoplastic resin layers; said layers being blended at their interfaces only, comprising the steps of bringing molten streams of said resins into intimate contact with each other to form the laminate shape desired and then cooling said laminate.

4,415,520

TIE LAYER FOR CO-EXTRUDED ACRYLONITRILE COPOLYMERS

Wayne T. Wiggins, Aurora, and Frank S. Gerry, Hudson, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 217,310, Dec. 17, 1980, Pat. No. 4,359,506. This application May 14, 1982, Ser. No. 378,151

Int. Cl.³ B29B *31/30*

U.S. Cl. 264—171 **18 Claims**

1. A coextrusion process wherein there are adhered together in the molten phase at a temperature in the range of 300° F. to 450° F. and passed through a shaping die to form a laminate

(I) a first outer layer composed of a nitrile barrier resin,

(II) a tie layer comprising a mixture of

(1) a nitrile barrier resin, and

(2) a halogenated polyolefin, and

(3) a thermoplastic resin other than (1) and (2), and

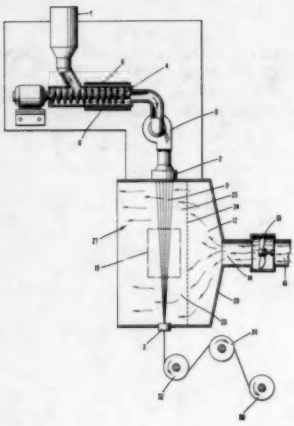
(III) a second outer layer composed of a thermoplastic resin.

4,415,521

PROCESS FOR ACHIEVING HIGHER ORIENTATION IN PARTIALLY ORIENTED YARNS

Robert M. Mininni, Maplewood; Sunil K. Garg, Westfield; Henry H. George, Jr., Berkeley Heights; Anne Holt, Westfield, and Steven B. Warner, Bernardsville, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,951
Int. Cl.³ D01D *1/04*
U.S. Cl. 264—176 F 23 Claims



1. A process for melt spinning a partially oriented yarn of increased birefringence for a given wind-up speed comprising extruding a molten fiber forming polyester through a shaped orifice to form a molten filamentary material,

passing said molten filamentary material in the direction of its length into a quench zone, wherein the filamentary material is initially contacted with a first gaseous quenching medium at a temperature well below the melting temperature of the filamentary material, and wherein prior to solidification so that the filamentary material is still in a deformable state, the filamentary material is passed through a hot zone provided with an atmosphere having a temperature greater than the temperature of the first gaseous quenching medium and greater than the glass transition temperature of the polyester filamentary material, with the resulting filamentary material then being withdrawn from said hot zone and contacted with a second gaseous quenching medium at a temperature below the glass transition temperature until the filamentary material is no longer deformable, and then

withdrawing the filamentary material from the quench zone;

with the said processing of the polyester filamentary material following the extrusion being conducted at a substantially constant take-up speed.

4,415,522

PROCESS FOR THE CONTINUOUS PRODUCTION OF HIGH MODULUS FILAMENT OF POLYETHYLENE

Giancarlo Capaccio, Leeds; Francis S. Smith, Harrogate, and Ian M. Ward, Bramhope, all of England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 943,855, Sep. 19, 1978, Pat. No. 4,254,072, which is a continuation of Ser. No. 860,999, Dec. 15, 1977, abandoned, which is a continuation of Ser. No. 553,656, Feb. 27, 1975, abandoned. This application Feb. 27, 1981, Ser. No. 238,852

Claims priority, application United Kingdom, Mar. 5, 1974, 09795/74

The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.

Int. Cl.³ D01D *5/12*
U.S. Cl. 264—210.8 2 Claims

1. A process for the continuous production of a high modulus filament of polyethlene of Mw not greater than 200,000 and $\overline{M}n$ not less than 5,000, which process comprises heating high density polyethylene to a temperature above its melting point, spinning a filament therefrom, quenching the filament at a rate of cooling in excess of 15° C. per minute and drawing the filament to a draw ratio of at least 17 to give a material having a 0.5% secant modulus greater than 158 g per dtex.

4,415,523

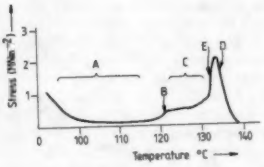
HEAT-TREATING COATED POLYOLEFIN FILMS

Peter J. Barham; Jeffrey A. Odell, both of Bristol, and Frank M. Willmouth, Royston, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 170,834, Oct. 13, 1981, Pat. No. 4,311,660. This application Oct. 13, 1981, Ser. No. 310,836

Claims priority, application United Kingdom, Aug. 7, 1979, 7927412

Int. Cl.³ B29C *25/00*
U.S. Cl. 264—342 R 6 Claims



1. A method of heat-treating a biaxially oriented polyolefin film comprising a polyolefin substrate having on at least one surface thereof a layer of polymeric heat-sealable material, a substantial proportion of which melts at a temperature below the melting temperature of the substrate polyolefin, the method comprising constraining the film against shrinkage, heating the constrained film to at least the minimum stress relaxation temperature of the polyolefin, and thereafter cooling the treated film to a temperature below the alpha-relaxation temperature of the polyolefin.

4,415,524

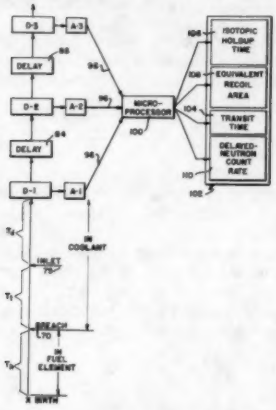
APPARATUS FOR AND METHOD OF MONITORING FOR BREACHED FUEL ELEMENTS

Kenny C. Gross, Lemont, and Robert V. Strain, Woodbridge, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 28, 1981, Ser. No. 258,351
Int. Cl.³ G21C *7/36*
U.S. Cl. 376—216 8 Claims

1. In the operation of a nuclear power reactor having a core, cladded fuel in the core, a coolant flowing through the core

over the cladded fuel, and heat exchanger means to cool the coolant and obtain useful energy thereby, an improved safety control to detect if any fuel cladding has a breach that allows delayed-neutron emitters to enter the coolant, the combination comprising means for conveying the coolant from the core through a loop flow circuit and back to the core, at least three separate delayed-neutron detectors and means for mounting each detector proximate the flow circuit operable to count the delayed neutrons released by emitters in the coolant when passing the detector, the first detector being located downstream from the core a distance corresponding to coolant flow time therebetween of between fifteen and forty seconds and the second and third detectors being spaced apart and downstream from the first and second detectors, respectively, each



corresponding to coolant flow time therebetween of between 1 and 3 seconds, the delayed-neutron activity at the detectors being a function of the delay time after reaction in the fuel until the coolant carrying the delayed-neutron emitter passes the respective detector, where $T_{TOTAL}=T_h+T_t+T_d$, means for calibrating the detectors during calibration operation of the reactor to determine T_d and at least one of T_h and T_t with respect to measured delayed-neutron counts on the detectors for the calibration fuel, and means for monitoring the detectors during reactor operation and for making repeated comparisons for the best fit line by the method of regression approximation of the delayed-neutron counts measured at the respective detectors and the delayed-neutron counts approximated for each detector according to the equations:

$$A_{dn}^{i}=\frac{\lambda_D^i\cdot P_n^i}{F\cdot T_h}\left(\frac{\lambda_p^i\cdot S_p^i\{\exp[-\lambda_p^i(T_t+T_d)]+\exp[-\lambda_D^i(T_t+T_d)]\}}{(\lambda_D^i-\lambda_p^i)\left(\lambda_p^i-\frac{1}{T_h}\right)}+\frac{\left(\frac{\lambda_p^i}{\lambda_p^i+\frac{1}{T_h}}\cdot S_p^i+S_D^i\right)\cdot\exp[-\lambda_D^i(T_t+T_d)]}{\lambda_D^i+\frac{1}{T_h}}\right) \quad (1)$$

and

$$A_{dn}^{TOTAL}=\sum_{i=1}^{i=9}A_{dn}^{i} \quad (2)$$

where

A_{dn}^{i} = Total delayed neutron activity at each detector attributable to isotope i, in counts/second/cm^3 of coolant;

A_{dn}^{TOTAL} = Total count of delayed neutrons at any detector, in counts/cm^3 of coolant;

λ_p^i, λ_D^i = Decay coefficient of parent and daughter isotopes of species i, in seconds $^{-1}$;

S_p^i, S_D^i = Fission production rates of parent and daughter isotopes of species i, in fissions/second;

P_n^i = Probability of emission of a delayed neutron for each daughter isotope, dimensionless; and

F = Flow rate of primary coolant through the reactor core, in cm^3/second;

T_h = Isotopic holdup time of delayed-neutron emitter in moving from reaction in the fuel to the coolant, in seconds;

T_t = Transit time of the delayed-neutron emitter in the coolant in flowing from breach to the inlet of the detector loop flow circuit, in seconds; and

T_d = Transit time of the delayed-neutron emitter in the coolant in flowing from the inlet of the detector loop to the detector, in seconds.

4,415,525

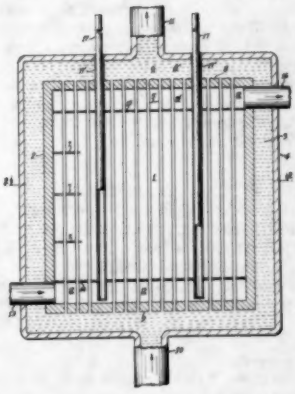
HETEROGENEOUS GAS CORE REACTOR

Nils J. Diaz, and Edward T. Dugan, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 961,379, Nov. 16, 1978, abandoned. This application Sep. 4, 1980, Ser. No. 184,134

Int. Cl.^{3} G21C 1/10

U.S. Cl. 376—317 **20 Claims**



1. A nuclear heterogeneous gas core reactor comprising a core barrel containing a fissionable gaseous fuel mixture of UF_6 and helium free of moderator material, an array of parallel tubes in said barrel outwardly surrounded by said fuel mixture, said tubes being filled with a solid moderator selected from the group consisting of graphite, beryllium, and beryllium oxide, said moderator being free of said gaseous fuel mixture and containing an interior passageway for the circulation of a heat extraction fluid to cool said moderator.

4,415,526

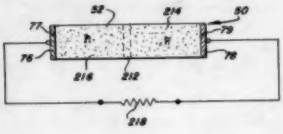
METAL PHTHALOCYANINE ON A SUBSTRATE

David L. Garrett, Cupertino, Calif., assignor to Metco Properties, Chicago, Ill.

Continuation-in-part of Ser. No. 801,636, May 31, 1977, which is a continuation-in-part of Ser. No. 535,218, Dec. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 166,687, Jul. 28, 1971, abandoned. This application Jan. 10, 1980, Ser. No. 111,079

Int. Cl.³ G21C 3/02

U.S. Cl. 376—409 30 Claims



1. An improved semi-conductor which comprises a film of fissionable, semi-conductive metal phthalocyanine, said film being substantially free of phosphorus nitride and derivatives of the same and being supported on the external surface of a solid, rigid substrate, said substrate being substantially free of water.

4,415,527

DESULFURIZATION PROCESS FOR FERROUS POWDER

Orville W. Reen, New Kensington, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1980, Ser. No. 217,292

Int. Cl.³ B22F 1/00; C21C 1/02; C22B 1/02

U.S. Cl. 419—31 13 Claims

1. A method of preparing ferrous powder melt stock containing a maximum of about 5 parts per million sulfur, comprising the steps of:

a. forming a molten ferrous alloy into a powder having sulfur in reducible form and having an average particle size of less than about 0.09 inch,

b. while maintaining an interconnected porosity of at least 10% for the powder, exposing the powder to a temperature of at least 2100° F. in a hydrogen containing atmosphere from a time of at least about 1 hour until the sulfur content of the powder is reduced to less than or equal to about 5 parts per million to form a sintered product, and

c. cooling the desulfurized powder to ambient temperature in a nonoxidizing atmosphere.

4,415,528

METHOD OF FORMING SHAPED METAL ALLOY PARTS FROM METAL OR COMPOUND PARTICLES OF THE METAL ALLOY COMPONENTS AND COMPOSITIONS

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Witec Cayman Patents, Limited, Cayman Islands, Cayman Islands

Filed Mar. 20, 1981, Ser. No. 245,670

Int. Cl.³ B22F 3/00

U.S. Cl. 419—46 18 Claims

1. A method of forming shaped metal alloy parts directly from either the individual metals or compounds containing the metal of the targeted alloy or both comprising the steps of:

(a) mixing together small particles taken from the class consisting of metals and metal compounds in an amount corresponding to the weight percentages of the individual metals present in the targeted alloy and an appropriate binder to form a homogeneous mixture of binder and particles,

(b) forming said mixture into a predetermined shape,

(c) removing said binder from said formed shape,

(d) placing said formed shape from (c) in a hydrogen atmosphere and at a temperature to maintain the dew point of said atmosphere on the reducing side of the dew point equilibrium curve for all of the metals forming the targeted alloy to convert all compounds to the metallic state, and

(e) sintering said formed shape from (d) in a reducing atmosphere and at a temperature to maintain the dew point of said atmosphere on the reducing side of the dew point equilibrium curve for all of the metals forming the targeted alloy in the sintering atmosphere.

4,415,529

MN-BASED ALLOY OF NONEQUILIBRIUM AUSTENITE PHASE

Tsuyoshi Masumoto; Akihisa Inoue, both of Sendai, and Hiroyuki Tomioka, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki and Tsuyoshi Masumoto, Sendai, both of, Japan

Filed Sep. 29, 1982, Ser. No. 426,442

Int. Cl.³ H01F 1/00; C22C 28/00

U.S. Cl. 420—434 7 Claims

1. An Mn-based alloy, comprising:

4 to 30 atomic % of at least one element selected from the group consisting of Al, Ni, and Cr;

1 to 15 atomic % of C;

30 atomic % or less of at least one element selected from the group consisting of Co, Mo, W, Ta, Nb, V, Ti, and Zr; and

the balance of the alloy to make up 100 atomic % being comprised substantially of Mn, the alloy having a nonequilibrium austenite phase.

4,415,530

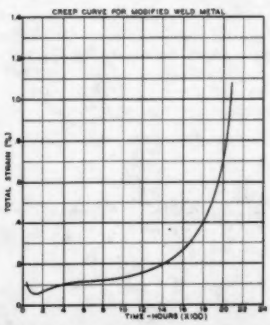
NICKEL-BASE WELDING ALLOY

James P. Hunt, Huntington, W. Va., assignor to Huntington Alloys, Inc., Huntington, W. Va.

Filed Nov. 10, 1980, Ser. No. 205,616

Int. Cl.³ C22C 19/05

U.S. Cl. 420—453 3 Claims

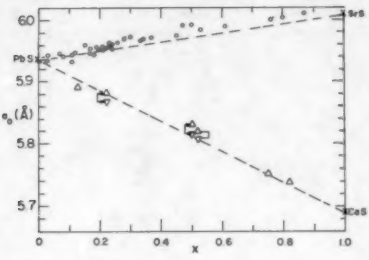


1. A welding alloy consisting essentially of from about 22% to about 24.5% chromium, from about 6% to about 7% tungsten, from about 3% to about 5% molybdenum, from about 1.5% to about 2.5% columbium, from about 1% to 3% manganese, up to about 5% iron, from about 0.05% to about 0.11% carbon, up to about 0.015% sulfur, up to about 0.75% silicon, up to about 0.5% copper, up to about 0.25% aluminum, up to about 0.6% titanium, up to 0.03% magnesium, up to about 0.5% cobalt, up to about 0.02% phosphorous, up to about 0.005% boron and the balance essentially nickel.

4,415,531
SEMICONDUCTOR MATERIALS

Henry Holloway, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 25, 1982, Ser. No. 392,190
Int. Cl.³ C01C *15/00*
U.S. Cl. 420—564 **3 Claims**



1. A semiconductor alloy having the chemical formula $Pb_{1-x}M_xS$, wherein the value of x is greater than 0 and less than 1 and M is selected from the group of elements consisting of Sr and Ca.

4,415,532
COBALT SUPERALLOY

Paul Crook, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Mar. 5, 1981, Ser. No. 240,642
Int. Cl.³ C22C *30/00*
U.S. Cl. 420—585 **5 Claims**

1. An alloy having an outstanding combination of properties including metal to metal (galling) resistance, hot hardness, toughness, cavitation erosion and corrosion resistance and consisting essentially of, in percent by weight: 0.2 to 0.6 carbon, 25 to 36 cobalt, 3.5 to 10 nickel, 24 to 30 chromium, 1 to 5 tungsten plus molybdenum, 2 to 9 niobium plus tantalum, 0.5 to 2.0 silicon, up to 2.0 manganese, 55 minimum cobalt plus chromium, the total content of aluminum plus copper plus titanium plus vanadium plus zirconium plus hafnium not over 2, phosphorous not over 0.01, sulfur not over 0.01, boron up to 0.2 and the balance iron plus normal impurities wherein the ratio of niobium-to-chromium is within the range between 1 to 3.5 and 1 to 6.5 to provide said outstanding combination of properties and wherein said tantalum is optional in the alloy and is not considered in said niobium-to-chromium ratio.

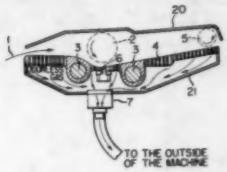
4,415,533
PROCESS FOR TREATING EXHAUST GAS FROM ELECTROPHOTOGRAPHIC MACHINE AND APPARATUS THEREOF

Tsuneo Kurotori, Tokyo; Manabu Mochizuki, Yokohama, and Susumu Tatsumi, Hino, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,320
Claims priority, application Japan, Jun. 18, 1980, 55-83374
Int. Cl.³ A61L *9/00*
U.S. Cl. 422—4 **14 Claims**

1. A process for treating an odorous exhaust gas which is generated during an electrophotography process, which comprises: forwarding an electrophotographic copy material bearing developer thereon through a heating zone and therein heating said copy material by a heater to dry or fix said developer on said copy material; contacting said odorous exhaust gas in said heating zone with a heated oxidation catalyst effective for converting said odorous exhaust gas to a substantially odorless gas, and simultaneously directly heating said oxidation catalyst with at least a portion of the heat supplied by said heater so that said heater is employed for both drying or fixing the developer and for heating said catalyst.

9. An apparatus for treating an odorous exhaust gas which is generated during an electrophotography process, which comprises: means defining an enclosed heating zone containing a bed of oxidation catalyst and a heater in direct heat exchange relationship with said oxidation catalyst bed, said oxidation

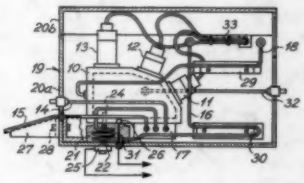


catalyst being effective, when heated, to convert said odorous exhaust gas to a substantially odorless gas, and means for forwarding an electrophotographic copy material bearing developer thereon through said heating zone so that said copy material is heated by said heater to dry or fix said developer on said copy material and said heater is simultaneously effective to directly heat said catalyst bed.

4,415,534
APPARATUS FOR ANALYZING BIOLOGICAL LIQUIDS

Finn C. Lundsgaard, Taastrup, and Willy Andersen, Espergaerde, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Filed Oct. 5, 1981, Ser. No. 308,775
Claims priority, application Denmark, Oct. 6, 1980, 4218/80
Int. Cl.³ G01N *1/14*
U.S. Cl. 422—58 **23 Claims**



1. An apparatus for analyzing biological liquids, said apparatus comprising

a measuring body including measuring means for measuring characteristics of said liquid,

a thermally shielding housing enclosing said body in spaced relationship therewith, said housing being made from a material with good thermal conductivity, and the space defined between said body and said housing containing a medium with poor thermal conductivity,

heat conductive connecting means placing a minor part of said housing in direct heat conductive contact with said body,

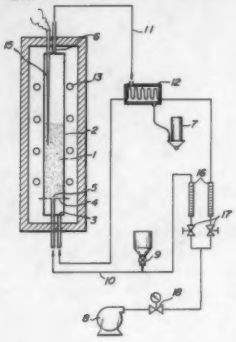
temperature regulating means arranged in heat conductive contact with said housing, and

a temperature sensor arranged in heat conductive contact with said body for controlling the function of said heat regulating means so as to maintain the temperature of said body at a substantially constant predetermined value.

4,415,535
APPARATUS FOR REFINING METAL CARBIDES CONTAINING FREE CARBON

Kunio Kato, Kiryu; Yoshiki Sugiyama, Gifu, and Ryo Enomoto, Ohgaki, all of Japan, assignors to Ibiden Co., Ltd., Gifu, Japan

Division of Ser. No. 109,114, Jan. 2, 1980, Pat. No. 4,327,067. This application Dec. 28, 1981, Ser. No. 334,901
Claims priority, application Japan, Jan. 18, 1979, 54-3337
Int. Cl.³ C01B *31/36, 31/30, 31/34;* **B01J** *8/32*
U.S. Cl. 422—143 **2 Claims**



1. An apparatus for refining metal carbide powders containing free carbon and having an average grain size of not more than 200 microns without substantial oxidation of the metal carbides, comprising a sealed vessel containing a fluidizing bed with a bed height at minimum fluidizing gas velocity within a range of 0.2–3.0 m consisting of heat-resistant particles having an average particle diameter of 150–500μ fluidized by an oxidizing gas, an inlet for introducing the oxidizing gas arranged at the lower end of the sealed vessel, a gas distributor which is a plate of porous heat-resistant and oxidation-resistant material having uniformly spaced small holes each having a diameter of not more than 5 mm and an opening ratio of cross-sectional area of the small holes to cross-sectional area of the sealed vessel within a range of 0.1–10% for dispersing the oxidizing gas in the fluidizing bed arranged at a lower part of the fluidizing bed, an inlet for charging the metal carbide powders which discharges substantially upwardly in immediate proximity to the gas distributor and is so arranged as to ensure generally even distribution of the metal carbide powders in the fluidizing bed, a heating member for heating the fluidizing bed arranged in the refining apparatus to a temperature of 800°–1100° C. to burn and remove the free carbon from the metal carbide powders, an outlet for discharging a mixture of refined metal carbide powders and combustion gas from the fluidizing bed arranged above the fluidizing bed, and a separator for recovering the refined metal carbide powders from the mixture discharged from the outlet.

4,415,536
APPARATUS FOR CONTACTING PARTICULATE MATERIAL WITH PROCESSING LIQUID

Paul A. Haas, Knoxville, and Allen D. Ryon, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jul. 2, 1982, Ser. No. 394,560
Int. Cl.³ G21C *21/00;* **B01J** *8/12, 8/20*
U.S. Cl. 422—159 **7 Claims**

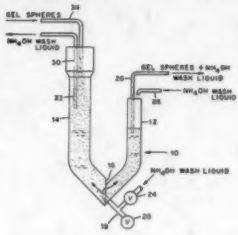
1. Apparatus for contacting particulate material with a liquid, comprising:

a pair of substantially cylindrical tubes having different diameters and each including a straight lower section inclined relative to a horizontal plane and a straight, vertically extending upper section, said tubes being communicatively joined to each other at their lower ends and said particulate material being introduced into the upper section of the tube having the larger diameter; and

means for introducing said liquid into the lower ends of said tubes.

2. The apparatus of claim **1** including means for removing said liquid from the upper sections of said tubes.

3. The apparatus of claim **2** wherein the lower section of



each of said tubes is inclined at an angle of about 45° relative to a horizontal plane.

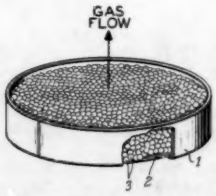
4. The apparatus of claim **3** wherein said means for introducing said liquid into the lower ends of said tubes comprises a conduit which extends into the tube having the larger diameter.

5. The apparatus of claim **4** including means for introducing a second stream of said liquid into the upper section of the tube having the smaller diameter.

4,415,537
CATALYTIC COMBUSTOR

Raymond W. Vine, Avon; John C. Trocciola, Glastonbury, and Herbert J. Setzer, Ellington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 1, 1982, Ser. No. 344,896
Int. Cl.³ B01D *53/36*
U.S. Cl. 422—180 **4 Claims**

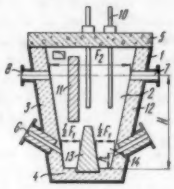


1. A solid fuel burning stove comprising an air inlet section, a combustion section, a combusted and uncombusted gas exhaust section, and a catalytic combustor in the exhaust section, wherein the improvement comprises utilizing a sulfur tolerant catalytic combustor for wood or coal comprising a high temperature stable lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina substrate impregnated with a sulfur tolerant, high activity rhodium combustion catalyst, said sulfur tolerant catalyst permitting interchangeable use of wood or coal as the solid fuel in the stove.

4,415,538
APPARATUS FOR CHLORINATION OF MOLTEN MAGNESIUM CHLORIDE SALTS

Andrei B. Ivanov, prospekt Smirnova, 59, kv. 151; Vladimir I. Schegolev, ulitsa Korablestroitelei, 29, korpus 4, kv. 252, both of Leningrad; Viktor A. Rudakov, ulitsa Puskina, 15, kv. 48, Ivano-Frankovskaya oblast, Kalush; Sergei P. Kosarev, Nalichnaya ulitsa, 39, korpus 1, kv. 20; Elizaveta A. Grigorieva, ulitsa 3 Internatsionala, 68, kv. 53, both of Leningrad; Alexandr T. Podanenko, ulitsa B. Khmelnitskogo, 48, kv. 69, Ivano-Frankovskaya oblast, Kalush; Oleg N. Romanenko, prospekt Lenina, 6, kv. 46, Ivano-Frankovskaya oblast, Kalush; Leonid P. Stavrov, ulitsa 50-letia VLKSM, 8, kv. 84, Ivano-Frankovskaya oblast, Kalush; Anatoly B. Kondratenko, ulitsa V. Tereshkovoi, 15, Ivano-Frankovskaya oblast, Kalush; Konstantin D. Muzhzhavlev, ulitsa Zheleznovodskaya, 48, kv. 30, Leningrad; Vladimir G. Ovcharenko, prospekt Lenina, 7"a", kv. 9, Ivano-Frankovskaya oblast, Kalush; Grigory P. Khristjuk, ulitsa Karpinskogo, 16, kv. 219, Leningrad; Alexei V. Vasiliev, ulitsa B.Khmelnitskogo, 66, kv. 57, Ivano-Frankovskaya oblast, Kalush; Anatoly L. Garkavy, ulitsa 40-letia Oktyabrya, 49, kv. 52, Ivano-Frankovskaya oblast, Kalush, all of U.S.S.R.; Ivan G. Gachegov, deceased, late of Ivano-Frankovskaya oblast, Kalush, U.S.S.R., and Lidia T. Gachegova, administrator, ulitsa B.Khmelnitskogo, 66, kv. 61, Ivano-Frankovskaya oblast, Kalush, U.S.S.R.

Filed Apr. 6, 1981, Ser. No. 251,173
Int. Cl.³ B01F *13/02*
U.S. Cl. 422—224 **2 Claims**



1. An apparatus for chlorination of molten magnesium chloride salts and the like, comprising a shell lined with a refractory material and having walls, a bottom and a cover,

said walls, said bottom and said cover forming an interior of said shell, said interior being devoid of gas distribution grate means;

melt feed inlet means for feeding the melt into said shell interior, said melt feed inlet means being mounted in the upper portion of one of said walls;

chlorinated melt outlet means for removing the chlorinated melt from said shell interior, said chlorinated melt outlet means being mounted in the upper portion of another of said walls;

chlorine inlet means mounted in the lower portion of said walls, and wherein

said shell interior being tapered downwardly so that the clear opening at the height of said chlorine inlet means is not over 0.3 times the clear opening at the height of said melt feed inlet means and said melt outlet means,

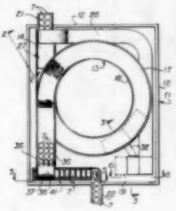
said shell interior further accommodating at least one partition mounted in said bottom, tapering upward and dividing said shell interior into chambers intercommunicating only at their tops, said chlorine inlet means being mounted in said walls on both sides of said partition, and wherein said partition has a height exceeding the distance from said bottom to said chlorine inlet means by a factor of at least two,

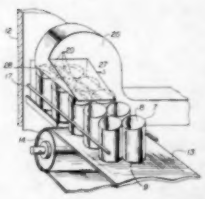
whereby by virtue of said tapered construction wherein the clear opening of the interior at the height of said chlorine inlet means is not over 0.3 times the clear opening at the height of said melt feed inlet means and said melt outlet means, said apparatus has a larger capacity than can be reliably obtained in apparatus which include gas distribution grate means.

4,415,539
CONTAINER STERILIZER AND DISCHARGE SYSTEM

Daniel W. Pohorski, San Jose, Calif., assignor to James Dole Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 236,766, Feb. 23, 1981. This application Feb. 26, 1982, Ser. No. 352,993
Int. Cl.³ A61L *2/06*
U.S. Cl. 422—304 **6 Claims**





1. A hot air aseptic packaging system container sterilizer, comprising a casing, a conveyor within said casing, means for feeding empty containers onto said conveyor with their open tops uppermost in a plurality of side-by-side rows, means for discharging containers from said conveyor, heating means, said heating means comprising a heater for raising the temperature of air to a sterilizing temperature, blowing means for blowing heated sterilizing air above atmospheric pressure, a first duct from said blowing means to said casing to distribute heated sterilizing air at a pressure throughout said casing to sterilize said containers as they pass on said conveyor through said casing, a second duct communicating with said first duct, a nozzle on said second duct having a flat bottom positioned over a portion of the path of travel of said containers along said conveyor, said bottom being elevated above the top of said conveyor, said bottom being apertured in a plurality of rows of apertures, each row presenting a plurality of apertures positioned to direct hot sterile air into said containers at a position off center relative to said containers, thereby causing a swirling motion of air within said containers to direct hot sterile air into said containers.

4,415,540
RECOVERY OF NON-FERROUS METALS BY THERMAL TREATMENT OF SOLUTIONS CONTAINING NON-FERROUS AND IRON SULPHATES

Igor A. E. Wilkomirsky; Roy S. Boorman, and Robert S. Salter, all of Fredericton, Canada, assignors to Provincial Holdings Ltd., Fredericton, Canada

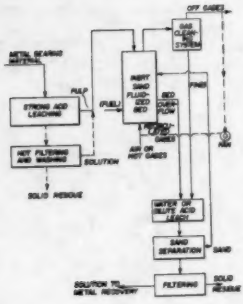
Continuation of Ser. No. 189,249, Sep. 22, 1980, Pat. No. 4,317,803, which is a continuation of Ser. No. 940,937, Nov. 11, 1978, Pat. No. 4,224,122. This application Feb. 8, 1982, Ser. No. 346,837

Claims priority, application Canada, May 5, 1978, 302719

The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.

Int. Cl.[3] C01G 9/06

U.S. Cl. 423—99 5 Claims



1. A method for recovering zinc from a strong sulphuric acid solution containing zinc and iron as sulphates or from zinc sulphide ores or concentrates, comprising:

(a) roasting said sulphate or zinc sulphide ore or concentrate in a subdivided form in an inert fluidized bed reactor at a temperature from 600 to 750° C. with 20–150% excess air for an average retention time of 1–12 hours resulting in an atmosphere comprising SO_2, SO_3, water vapour and remaining O_2 and N_2 from the air, to obtain a calcine containing ferrite and sulphates, oxysulphates and oxides of zinc, plus hematite;

(b) leaching said calcine with water or dilute sulphuric acid solution in such a manner that the sulphates, oxysulphates, and oxides of zinc are leached out in part from the calcine into the water or dilute sulphuric acid solution;

(c) subjecting the leach pulp resulting from step (b) to a liquid-solid separation step to yield a leach solution suitable for purification-metal recovery steps for zinc;

(d) leaching the solid residue resulting from step (c) with strong sulphuric acid solution in such a manner that the ferrite and unreacted sulphides of zinc are converted to the sulphates of iron and zinc;

(e) subjecting the pulp resulting from step (d) to a liquid-solid separation step to obtain a leach solution containing said sulphates of iron and zinc; and

(f) recycling said sulphate solution obtaining in step (e) in a subdivided form into an inert fluidized bed in such a manner that the dry calcine contains zinc sulphate and iron sulphate and/or hematite, said inert fluidized bed being fueled by the off gas from roasting step (c).

4,415,541
METHOD OF RECOVERING NICKEL FROM A SPENT FAT HARDENING CATALYST

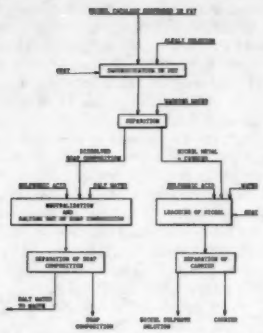
Ake L. Melin, Oskarshamn, Sweden, assignor to SAB Nife AB, Landskrona, Sweden

Filed Feb. 11, 1982, Ser. No. 348,139

Claims priority, application Sweden, Feb. 12, 1981, 8100983

Int. Cl.[3] C01G 53/04, 53/10; C11C 13/00; B01J 23/94

U.S. Cl. 423—140 2 Claims



1. A method of recovering nickel from a spent fat hardening catalyst consisting of finely divided nickel metal on a carrier material and suspended in fat, characterized in that the fat is saponified into a solution of soap composition by adding an alkaline aqueous solution consisting of the waste product of contaminated alkali hydroxide solution from the preparation of electrodes in the accumulator industry to the fat hardening catalyst, then separating the nickel metal and the carrier from the solution of soap composition, after which the nickel metal is leached out of the carrier by means of sulphuric acid, nickel being recovered in the form of nickel sulphate solution and the separated solution of soap composition is neutralized and salted out by means of sulphuric acid and a salt solution and the soap composition is separated from the solution as a product, the method being an improved industrial process using chemical waste materials as primary chemical reactants characterized in that the salt solution used consists of waste solution from the product of nickel mass in the accumulator industry which has been purified of heavy metals by means of ion exchangers and which mainly contains sodium sulphate dissolved in water.

2. A method as claimed in claim 1, characterized in that the nickel sulphate solution recovered is treated for the production of active nickel hydroxide mass for alkaline electrical accumulators.

4,415,542
CONTROLLING SCALE COMPOSITION DURING ACID PRESSURE LEACHING OF LATERITE AND GARNIERITE ORE

Paul B. Queneau, Golden; Robert E. Doane, Lakewood; Mark H. Berggren, Golden, and Mark W. Cooperrider, Arvada, all of Colo., assignors to Compagne Francaise D'Entreprises Minieres, Metallurgiques et D'Investissements, Paris, France

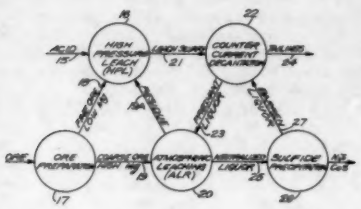
Filed Jun. 21, 1982, Ser. No. 390,450

Int. Cl.[3] C01G 53/00, 49/00

U.S. Cl. 423—141 12 Claims

1. A method of controlling the scaling of autoclave and leaching equipment surfaces in the high-pressure sulfuric acid leaching of nickeliferous ores containing, in addition to nickel, oxides and silicates of aluminum, iron, and magnesium, wherein the high-pressure leach is carried out on an ore feed material charged to an autoclave while the autoclave is maintained at an elevated temperature in the range of about 180° C. to 300° C. at which scaling occurs which comprises:

controlling the magnesium content of at least a portion of the ore feed material to a relatively high level falling within the range of about 3% to 30% by weight and at a pulp density to provide a concentration of magnesium in the sulfuric acid solution during ore dissolution at a level



at least sufficient to inhibit the formation of scale containing substantial amounts of alunite while favoring the formation of scale containing substantial amounts of magnesium as magnesium sulfate characterized by being soluble in water or in dilute sulfuric acid and thereby of being easily removed by chemical dissolution.

4,415,543

PROCESS FOR TREATING PHOSPHO-GYPSUM WASTE PRODUCT FROM WET-ACID PROCESS OF MAKING PHOSPHORIC ACID

Eddie K. Wilson, Sr., 6915 Silver Maple Cove, Memphis, Tenn. 38119, and Silvio J. Spigolon, 7155 Riverdale Cove, Memphis, Tenn. 38138

Continuation-in-part of Ser. No. 120,825, Feb. 12, 1980, Pat. No. 4,312,842. This application Jan. 25, 1982, Ser. No. 342,474

Int. Cl.³ C01F *1/00, 5/10;* **C01B** *25/16*

U.S. Cl. 423—178 **9 Claims**

1. A process for treating phospho-gypsum waste product which is produced in the manufacture of phosphoric acid by the wet-acid process in which suitable phosphate rock is treated with sulfuric acid, comprising:

(a) washing phospho-gypsum waste product from the production of phosphoric acid with water to remove a portion of the fluorine values and part of the P_2O_5 values;

(b) subsequently recovering those values in a water treatment process;

(c) heating the washed phospho-gypsum product to about 850° C. to remove an additional part of the P_2O_5 values and substantially all of the remaining fluorine values as a gas, and then returning the P_2O_5 values and fluorine values to the water treatment process; and

(d) calcining the treated phospho-gypsum product at about 850° C. to about 1250° C. to recover sulfur values in the form of sulfur dioxide and sulfur trioxide.

4,415,544

MODIFICATION OF CATALYTIC ACTIVITY OF POROUS ZEOLITES

George T. Kokotailo, Woodbury; Albert C. Rohrman, Jr., Gibbstown, and Stephen Sawruk, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,830

Int. Cl.³ C01B *33/28;* **B01J** *29/06*

U.S. Cl. 423—328 **9 Claims**

1. A method for altering catalytic activity of the cationic form of a porous crystalline zeolite which comprises the sequential steps of loading all pores and channels of said zeolite with a paraffinic wax, contacting the wax loaded zeolite with an aqueous hydrogen fluoride solution of from about 0.005 Normal to about 0.5 Normal at a temperature of from about 20° C. to about 35° C. and a pressure of from about atmospheric to about 40 psig for a contact time of from about 1 hour to about 10 hours, and calcining the hydrogen fluoride solution contacted zeolite at a temperature of from about 200° C. to about 600° C.

4,415,545

SOLID FILM GROWTH VIA PREFERENTIAL ETCHING OF LIQUID SOLUTIONS

Joseph R. Monkowski, R.D. #1, Box 141-A1, Bellefonte, Pa. 16823, and Richard E. Tressler, R.D. #1, Julian, Pa. 16844

Filed Dec. 15, 1980, Ser. No. 216,198

Int. Cl.³ C01B *33/02, 19/00, 25/08;* **C01G** *30/00*

U.S. Cl. 423—348 **44 Claims**

1. A process for growing crystals, having a breadth of at least 500 microns, from a crystallizable inorganic compound which comprises forming a solution of the compound in a liquid solvent for the compound, forming a film of the solution and etching the solvent from the film with an etching gas which reacts with the solution to preferentially etch the solvent from the solution until crystals of said compound, having a breadth of at least 500 microns form; said solution, at etching pressure, having a solidification temperature lower than the melting or sublimation temperature of the compound and higher than the condensation temperatures of the etching gas and of reaction products formed by the etching, said etching temperature being between the solidification temperature of the solution and the melting or sublimation temperature of the compound, lower than the vaporization temperatures of the solvent and solution and higher than the condensation temperatures of the etching gas and reaction products and the etching time being between 1 minute and 1 hour.

4,415,546

BIOLOGICALLY ACTIVE ANALOGS OF ACTH AND RADIOIMMUNO ASSAY THEREFOR

Janakiraman Ramachandran, 3279 Emerson St., Palo Alto, Calif. 94306; Douglas I. Buckley, 1379 A 5th Ave.; Donald H. Yamashiro, 1375 18th Ave. Apt. 1, both of San Francisco, Calif. 94122, and James R. Hagman, 1935 Haste St. Apt. 3, Berkeley, Calif. 94704

Filed May 12, 1981, Ser. No. 262,974

Int. Cl.³ G01N *33/56, 33/58;* **C07C** *103/52*

U.S. Cl. 424—1.1 **18 Claims**

1. A steroidogenically active polypeptide and analog of corticotropin having the formula:

H-Ser-Phe-Ser-Nle-Glu-His-Phe-Arg-Trp-Gly-Lys-Pro-Val-Gly-Lys-Lys-Arg-Arg-Pro-Nal-Lys-Val-Tyr-Pro-Asn-Gly-Ala-Glu-Asp-Glu-Ser-Ala-Glu-Ala-Phe-Pro-Leu-Glu-Phe-OH.

2. The composition of claim 1 wherein the polypeptide is shortened by one or more amino acid moieties at the -OH end.

4,415,547

SUSTAINED-RELEASE PHARMACEUTICAL TABLET AND PROCESS FOR PREPARATION THEREOF

Andrew B. C. Yu, Albany, and Phillip M. John, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,435

Int. Cl.³ A61K *9/22, 9/24, 9/26, 9/32*

U.S. Cl. 424—19 **8 Claims**

1. A sustained-release pharmaceutical tablet consisting essentially of

(A) from about 35% to about 85% by weight of a plurality of encapsulated pellets each consisting essentially of

(a) from about 30% to about 98% by weight of a sugar-starch bead which is coated with

(b) from about 1% to about 70% by weight of a first coat consisting of from about 75% to about 99% by weight of theophylline an orally administrable drug and from about 1% to about 25% by weight of a water-soluble drug-binding substance selected from the group consisting of polyvinylpyrrolidone, polyvinyl alcohol, methylcellulose and hydroxypropyl methycellulose and

(c) from about 1% to about 15% by weight of a second coat consisting essentially of from about 1% to about 10% by weight of a water-soluble film-forming substance selected from the group consisting of polyvinylpyrrolidone, polyvinyl alcohol, methylcellulose and hydroxypropyl methylcellulose, from about 1% to about 60% by weight of a water-insoluble film-forming substance consisting of ethylcellulose and from about 30% to about 98% by weight of a dusting powder selected from the group consisting of talc, silicon dioxide and titanium dioxide, which encapsulated pellets are blended and compressed into tablet form with

(B) from about 15% to about 65% by weight of a compressible tableting mixture consisting essentially of from about 20% to about 40% by weight of a diluent selected from the group consisting of the monosaccharides and the disaccharides, from about 30% to about 50% by weight of a diluent-binder consisting of microcrystalline cellulose, from about 10% to about 30% by weight of a binder consisting of ethyl cellulose, and from about 5% to about 20% by weight of a hydrophobic lubricant selected from the group consisting of hydrogenated vegetable oil, stearic acid, magnesium stearate and calcium sterate.

4,415,548

SPERMICIDALLY LUBRICATED PROPHYLACTICS AND METHOD FOR MAKING SAME

K. Prakash Reddy, Anderson, S.C., assignor to Schmid Laboratories, Inc., West Little Falls, N.J.

Continuation of Ser. No. 120,739, Feb. 12, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,654

Int. Cl.[3] **A61F** *5/00;* **A61K** *9/70;* **A61L** *31/00;* **B29C** *13/00*

U.S. Cl. 424—28 **11 Claims**

1. A method for manufacturing a lubricated spermicidal male contraceptive which comprises:

(a) dipping a phallic shaped mandrel of predetermined size into a warm bath consisting of latex rubber;

(b) withdrawing said mandrel bearing a coating consisting essentially of latex rubber from the latex bath;

(c) allowing the latex rubber coating on said mandrel to harden to form a sheath conforming to the shape of said mandrel;

(d) unrolling the sheath from said mandrel to form a cup;

(e) dispensing an effective contraceptive amount of a migratory pharmaceutical formulation comprising a liquid nonionic surfactant spermicidal agent having an approximately neutral pH, and a polyethylene glycol lubricant composition into the latex cup whereby the pharmaceutical formulation migrates by capillary action substantially throughout the inner and outer surfaces of the latex sheath; and

(f) sealing the latex sheath containing said spermicide and said lubricant in an airtight container.

4,415,549

TOOTHPASTES WITH REDUCED SALINITY

Nutan B. Shah, New Rochelle, N.Y., and Marvin K. Cook, Port Charlotte, Fla., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed May 17, 1982, Ser. No. 378,889

Int. Cl.[3] **A61K** *9/16, 9/18*

U.S. Cl. 424—52 **9 Claims**

1. A water-containing toothpaste comprising an effective amount of strontium disodium ethylenediamine tetraacetate for alleviating sensitivity of hyper-sensitive dentin, an effective anti-caries amount of sodium fluoride, sodium monofluorophosphate or mixtures thereof and at least 0.001 percent by weight, based on the total weight of the toothpaste, of monoammonium glycyrrhizinate, wherein said toothpaste is characterized by the substantial absence of substances which can replace strontium from said strontium disodium ethylenediamine tetraacetate.

4,415,550

TREATMENT-AND-PROPHYLACTIC TOOTH PASTE POSSESSING ANTICARIOUS EFFECT

Gennady N. Pakhomov, Leninsky prospekt 123/1, kv. 529, Moscow; Anita Y. Luste, ulitsa Lachplesha 27, kv. 22; Galina I. Kadnikova, ulitsa Ya. Rudzutaka 60, kv. 10, both of Riga; Analy G. Kolesnik, ulitsa Shosseinaya, 58, korpus 2, kv. 59, Moscow; Lidia N. Lubotskaya, ulitsa Maskavas 108/110, kv. 4, Riga; Rita M. Plavvnietse, "Plyavnieki", Rizhsky raion p/o "Katlakalns"; Jury A. Tarasenko, ulitsa Dzirtsiema 43, kv. 9, Riga, all of U.S.S.R., and deceased Konstantinov, late of Riga, U.S.S.R. (by Aina R. Sils, administrator)

Filed Mar. 4, 1983, Ser. No. 472,227

Int. Cl.[3] **A61K** *7/18, 33/16, 35/32*

U.S. Cl. 424—57 **4 Claims**

1. A treatment-and-prophylactic tooth paste possessing an abrasive agent, a gelating agent, a wetting agent, a surfactant, a flavouring agent, 0.5 to 2% by weight of a substance possessing anticaries effect comprising a product obtained by treatment of a bone tissue with a diluted mineral acid till a complete dissolution of mineral components and water-soluble proteins contained in the bone tissue, separation of the resulting solution, dilution thereof with water with the addition of citric acid or salts thereof as a stabilizing agent, followed by neutralization of the solution and drying and containing the following components, percent by weight:

calcium	2 to 6
sodium	19 to 23
potassium	0.04 to 0.18
mineral acid anion	6 to 10.6
orthophosphoric acid anion	1.5 to 5.0
water-soluble proteins	1.0 to 5.0
magnesium	0.05 to 0.2
a mixture of trace elements including fluorine, manganese, tin, zinc, iron	0.01 to 0.02
complex citrate compounds as calculated for citric acid anion	the balance.

4,415,551

BIOERODIBLE DEODORANT

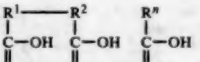
Florence S. Fang, Bethesda, Md., assignor to The Gillette Company, Boston, Mass.

Filed Jan. 29, 1982, Ser. No. 344,089

Int. Cl.[3] **A61K** *7/32, 31/74, 31/14*

U.S. Cl. 424—65 **4 Claims**

1. A sustained release bioerodible deodorant formulation for use on the human body consisting essentially of a cosmetically acceptable, non aqueous organic solvent solution containing 2 to 20% by weight of a mixture of a quaternary ammonium germicidal material and a carboxylic polymer having the general formula:



in which R^1, R^2,-R^n are organic radicals selected from the group consisting of hydrocarbon radicals and hetero-atom containing radicals, in which the R's are selected to provide an average of from 8 to 22 carbon atoms for each acidic carboxylic hydrogen and in which the value of n is selected to provide a molecular weight of about 10,000 to 800,000; the molar ratio of said carboxylic polymer to said germicidal material being from about 13:1 to 1:1.

4,415,552

COMPOSITION FOR ESTABLISHING IMMUNOLOGICAL TOLERANCE

Erwin Diener, and Uriel Diner, both of Edmonton, Canada, assignors to The Governors of The University of Alberta, Edmonton, Canada

Continuation-in-part of Ser. No. 9,910, Feb. 6, 1979, abandoned. This application Dec. 5, 1979, Ser. No. 100,346

Int. Cl.[3] **A61K** *39/35, 39/385, 39/39, 31/72, 31/73, 47/00*

U.S. Cl. 424—91 **16 Claims**

1. A pharmaceutically acceptable injectable composition consisting essentially of a water soluble conjugate of:

a substantially non-cross-linked water soluble carboxymethyl cellulose carrier, and

a plurality of allergen molecules, each chemically attached to a carboxyl group of the carboxymethyl cellulose carrier, said composition being capable upon injection in a mammal of inducing immunological tolerance to the allergen without evoking an allergenic response to the allergen.

7. A method of converting an allergen molecule to a form immunologically acceptable for inducing an immunological tolerance in mammals to the allergen without evoking an allergenic response thereto, comprising:

condensing each of a plurality of allergen molecules to a carboxyl group of a water soluble carboxymethyl cellulose carrier to form a water soluble carboxymethyl cellulose-allergen conjugate in which the carboxymethyl cellulose strands are substantially non-crosslinked; and recovering the resulting conjugate from the reaction mixture as a pharmaceutically acceptable injectable composition.

4,415,553

COMPOSITIONS, PROCESSES FOR THEIR PREPARATION AND METHOD FOR TREATMENT OF NEOPLASMS

Harry P. Zhabilov, and Todor Y. Karavassileff, both of Razgrad, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

Continuation-in-part of Ser. No. 861,072, Dec. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 577,719, May 15, 1975, abandoned, and Ser. No. 478,156, Jun. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 364,654, May 23, 1973, abandoned, which is a continuation of Ser. No. 51,094, Jan. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 865,539, May 19, 1969, abandoned, which is a continuation of Ser. No. 652,043, Jul. 10, 1967, abandoned, which is a continuation-in-part of Ser. No. 572,236, Aug. 15, 1966, abandoned, and Ser. No. 533,037, May 26, 1966, abandoned, said Ser. No. 572,236, is a continuation-in-part of Ser. No. 533,037, , abandoned. This application Mar. 5, 1980, Ser. No. 127,343

Claims priority, application Bulgaria, Aug. 6, 1973, 23841

Int. Cl.[3] **A61K** *37/10, 35/12, 39/00;* **C12P** *21/00, 21/06;* **C12N** *15/00, 5/00*

U.S. Cl. 424—95 **14 Claims**

1. Process for preparing antigenic compositions adapted for the treatment of neoplastic diseases in mammals which comprises isolating from the cell nuclei from neoplastic animal tissue (1) a cancer-active single-strand DNA, (2) a cancer-active RNA, and (3) an arginine-rich histone fraction, deaggregating at least one other portion of said cell nuclei by enzymatic treatment with pepsin and isolating from the resulting deaggregated mixture (4) a lysine-rich histone fraction and thereafter recombining fractions (1), (2), and (4) in the presence of streptomycin-cysteine, and combining the product thereof with fraction (3) whereby said four components are reformed by selective recombination/hybridization into antigenic compositions, the components of which have properties and contain amounts of constituents relative to each other in the following ranges:

A. Single-strand DNA—Molecular weight, 0.5×10^6 to about 1.5×10^6

B. RNA sedimentation constant—4S to 8S

C. Lysine rich histone Fraction A-1 (LRF):
Molecular weight: 12,000 to 14,000
Lysine to arginine mole ratio: 0.5:1 to 4:1
DNA to LRF weight ratio: 0.5:1 to 4:1

D. Arginine rich histone fraction (ARF):
Molecular weight: 10,500 to 13,000
Lysine to arginine mole ratio 0.3:1 to 0.7:1
RNA to ARF weight ratio: 0.8:1 to 3.5:1

E. LRF to ARF weight ratio: 3:1 to 1:4

F. DNA to RNA weight ratio: 0.3:1 to 3:1

6. The antigenic composition prepared by the process of claim 1.

7. Antigenic compositions prepared according to the process of claim 1 and adapted for the treatment of neoplastic diseases in mammals, said compositions containing s-DNA, RNA, lysine rich histones and arginine rich histones isolated from cell nuclei of donor animal tumors in which the ratio of active cancer single-strand DNA to cancer active RNA in the animal tumor is present in about the same ratio of the cancer active single strand DNA to the cancer active RNA in said mammals.

4,415,554

TREATMENT FOR MENSTRUAL DISORDERS

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, London, England

Continuation-in-part of Ser. No. 89,293, Oct. 30, 1979, Pat. No. 4,302,477, which is a continuation-in-part of Ser. No. 4,924, Jan. 19, 1979, Pat. No. 4,373,763. This application Jun. 10, 1981, Ser. No. 272,083

Claims priority, application United Kingdom, Jan. 23, 1978, 2642/78; Feb. 7, 1978, 4921/78; Apr. 19, 1978, 15481/78; Aug. 17, 1978, 33682/78; Oct. 24, 1978, 41761/78

Int. Cl.[3] **A61K** *33/30, 31/20, 31/23, 31/54*

U.S. Cl. 424—145 **14 Claims**

1. A method of treating menstrual disorders comprising administering to a person suffering therefrom an effective amount of γ-linolenic acid or physiologically functional derivative thereof and/or dihomo-γ-linolenic acid or physiologically functional derivative thereof, said menstrual disorders manifested by irregular menstrual cycle lengths or excessive duration or amount of blood loss or premenstrual syndrome of depression, pain and fluid retention.

4,415,555

COMPOSITION AND METHOD FOR TREATING IRON DEFICIENCY SYNDROME

Hitoshi Anabuki, and Shigeo Miyata, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry C. Ltd., Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 359,126

Claims priority, application Japan, Mar. 24, 1981, 56-41723

Int. Cl.[3] **A61K** *33/26;* **C01B** *31/24;* **C07F** *5/06;* **A61K** *31/295*

U.S. Cl. 424—147 **18 Claims**

1. A composition for increasing the iron level in hemoglobin and serum in a subject in need thereof comprising,

(1) an amount, effective for increasing said iron level, of a compound having a hydrotalcite-like crystal structure and represented by the following formula (1)

$$(Fe^{2+},Mg^{2+})_x(Al^{3+},Fe^{3+})_2(OH)_{2x+6-z}\cdot z(A^{n-})_{z/n}\cdot mH_2O \quad (1)$$

wherein A^{n-} represents an anion having a valence of n, Mg^{2+} is within the range of $O \leqq Mg^{2+} < _1$, Fe^{3+} is within the range of $Q \leqq Fe^{3+} < 2$, x is a number represented by $1 \leqq x < 20$, z is a number represented by $O < z < 3$, and m is a number represented by $O \leqq m < 8$, and

(2) a pharmaceutically acceptable diluent or carrier.

4,415,556

PROTECTIVE SOLUTION FOR HEART AND KIDNEY AND PROCESS FOR ITS PREPARATION

Hans-Jurgen Bretschneider, Bovenden, Fed. Rep. of Germany, assignor to Dr. Franz Köhler Chemie GmbH, Alsbach-Bergstrasse, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,078

Claims priority, application Switzerland, Dec. 23, 1980, 9510/80

Int. Cl.³ A61K *31/19, 31/40, 31/70, 33/06, 33/10, 33/14*

U.S. Cl. 424—153 5 Claims

1. In a method for preventing ischemia damage to the heart, kidneys and other organs during operations and transplants thereof, wherein an ischemia damage preventing effective amount of a solution containing a buffer system composed of histidine; histidine chloride, and tryptophane and the conventional electrolytes for cardioplegic solutions is administered, the improvement which comprises said solution also containing an ischemia damage protecting amount of α-ketoglutarate.

4,415,557

ANTIBIOTIC COMPOUND, ITS PRODUCTION AND ITS MEDICINAL USE

Karl G. Metzger; Jörg Pfitzner; Delf Schmidt, all of Wuppertal; Horst Weyland, Bremerhaven; Günter Benz, Velbert, and Theo Schröder, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

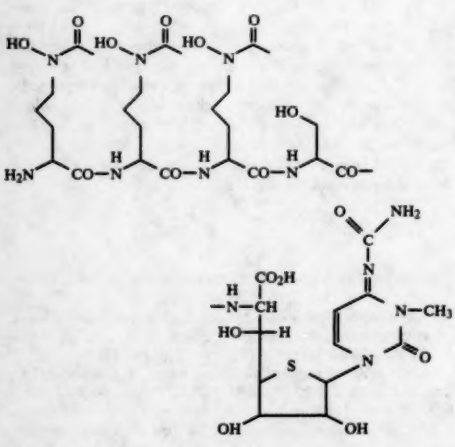
Filed Jan. 18, 1982, Ser. No. 340,449

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102137

Int. Cl.³ C07C *103/52;* A61K *31/495*

U.S. Cl. 424—172 6 Claims

1. An antibiotic compound which, in the iron-free form, is of the formula



4,415,558

CRF AND ANALOGS

Wylie W. Vale, Jr., La Jolla; Joachim Spiess, Encinatas; Catherine L. Rivier, and Jean E. F. Rivier, both of La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 271,624, Jun. 8, 1981, abandoned. This application May 17, 1982, Ser. No. 378,999

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 31 Claims

1. A pharmaceutical composition for lowering the blood pressure of a mammal and/or for elevating the secretion of ACTH and corticosteroids comprising CRF or analogs of CRF or the nontoxic addition salts thereof having the formula:

Z-R_1-Pro-Pro-Ile-Ser-R_8-Asp-Leu-R_{11}-R_{12}-R_{13}-Leu-Leu-Arg-R_{17}-R_{18}-R_{19}-Glu-R_{21}-R_{22}-Lys-R_{24}-R_{25}-R_{26}-R_{27}-R_{28}-Gln-Gln-Ala-R_{32}-R_{33}-Asn-Arg-R_{36}-Leu-Leu-Asp-R_{40}-R_{41}-NH_2

wherein Z is an acyl group having 7 or less carbon atoms or hydrogen; R_1 is Ser-Gln-Glu or pGlu-Gly or Gln-Glu or Glu or D-Ser-Gln-Glu or D-pGlu-Gly or desR_1; R_8, R_{12}, R_{19}, R_{24} and R_{40} are selected from the group consisting of Leu, Ile, Ala, Gly, Val, Nle, Phe and Gln; R_{11} is Thr or Ser; R_{13} is His, Tyr or Glu; R_{17} is Glu or Lys; R_{18} is Val or Met; R_{21} is Met, Met(O), Ile, Ala, Leu, Gly, Nle, Val, Phe or Gln; R_{22} is Thr or Glu; R_{25} is Asp or Glu; R_{26} is Gln or Lys; R_{27} is Leu, Ile, Ala, Gly, Val, Nle, Phe, Asp, Asn, Gln or Glu; R_{28} is Ala or Lys; R_{32} is His, Tyr or Ala; R_{33} is Ser, Asn, Thr or Ala; R_{36} is Lys or Leu; R_{41} is Ala, Ile, Gly, Val, Leu, Nle, Phe, Gln or des R_{41}, provided however that when R_{13} is His, then R_{17} is Glu, R_{18} is Val, R_{22} is Thr, R_{26} is Gln, R_{28} is Ala, and R_{36} is Lys; and provided that when R_{13} is Glu, R_{17} is Lys, R_{18} is Met, R_{22} is Glu, R_{26} is Lys, R_{28} is Lys, R_{32} is Ala and R_{36} is Leu, then either R_1 is not pGlu-Gly or R_8 is not Ile or R_{11} is Thr or R_{12} is not Leu or R_{19} is not Ile or R_{21} is not Ile or R_{24} is not Gln or R_{27} is not Glu or R_{33} is not Asn or R_{40} is not Thr or R_{41} is not Ile, and a pharmaceutically acceptable liquid or solid carrier therefor.

4,415,559

ANTICOAGULANT

Suguru Suzuki, Tokyo; Noritoshi Sano, Kawasaki, and Tetsuya Tajima, Nagareyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,834

Claims priority, application Japan, Feb. 12, 1981, 56-17994

Int. Cl.³ A61K *31/725*

U.S. Cl. 424—183 8 Claims

1. A method of treating a mammal to inhibit endogenous coagulation of the circulating blood which comprises administering to said mammal, by intravenous administration or intramuscular injection, a therapeutically effective amount of an anticoagulant composition consisting essentially of heparin having low antithrombin III affinity as an effective ingredient, in combination with a pharmacologically acceptable carrier, diluent or vehicle.

4,415,560

1-OXA-2,6-DISILACYCLOHEXANE-4-CARBOXAMIDES

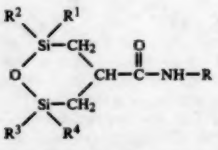
Sandor Barcza, Mt. Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Oct. 12, 1982, Ser. No. 433,464

Int. Cl.³ C07F *7/08, 7/10*

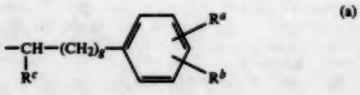
U.S. Cl. 424—184 15 Claims

1. A compound of the formula:

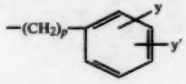


wherein each of R^1, R^2, R^3 and R^4 is, independently, alkyl having from 1 to 4 carbon atoms; and

R is of type (a) an aralkyl-type radical of the structure

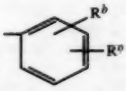


wherein g is 0, 1 or 2;
R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;
R^b is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and
R^c is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure



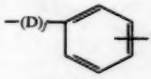
(ii)

in which p is 0, 1 or 2, and
y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and
y' is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or
subtype (iii) alkyl having from 1 to 8 carbon atoms; or
R is of type (b) a phenyl-type radical of the structure

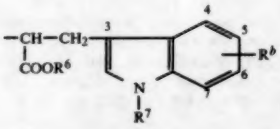


(b)

in which R^b is as defined above, and
R^o is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or
R^o is a radical of the structure R/:

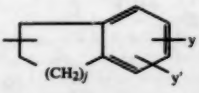


in which D is $-CH_2-$ or $-O-$;
f is 0 or 1; and
W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or
R is of type (c) an indolyl radical of the structure:



(c)

wherein R^b is as defined above;
R^6 is alkyl having from 1 to 8 carbon atoms or benzyl; and
R^7 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or
R is (d) a benzocycloalkyl nucleus of the structure:



(d)

wherein y and y' are as defined above; and
j is a whole integer of from 1 to 4.

4,415,561

SYNERGISTIC ARTHROPODICIDAL COMPOSITION

Wolfgang Behrenz, Overath; Manfred Schütte, and Klaus Naumann, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,495
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109476
Int. Cl.³ A01N *57/00, 37/00, 47/10*
U.S. Cl. 424—219 **7 Claims**

1. An arthropodicidally active composition comprising an effective amount of (I) IR-(−)[(pentafluorophenyl)-methyl]-3S-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate and (II) O,O-dimethyl O-(2,2-dichlorovinyl) phosphate wherein the ratio of (I):(II) is from about 1:6 to 1:50.

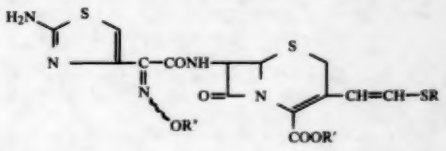
4,415,562

3-THIOVINYLCEPHALOSPORINS AND PHARMACEUTICAL COMPOSITIONS

Daniel Farge; Pierre L. Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 19, 1981, Ser. No. 322,901
Claims priority, application France, Nov. 20, 1980, 80 24633
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ A61K *31/545;* **C07D** *501/24*
U.S. Cl. 424—246 **16 Claims**

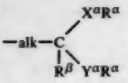
1. A 3-thiovinylcephalosporin of the formula:



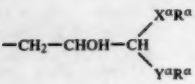
in which:
α. the symbol R is chosen from amongst the following meanings:
(1) alkyl, L-2-amino-2-carboxyethyl or phenyl,
(2) pyrid-2-yl, pyrid-3-yl or pyrid-4-yl and their N-oxides,
(3) pyrimidin-2-yl, pyridazin-3-yl substituted in the 6-position (by an alkyl, methoxy, amino or alkanoylamino radical) and optionally N-oxidised, or tetrazolo[4,5-b]pyridazin-6-yl,
(4) 5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 4-position, or 1,3,4-triazol-5-yl or 2-alkoxycarbonyl-1,3,4-triazol-5-yl substituted in the 1-position, by
(a) an alkyl radical which is unsubstituted or substituted by an alkoxy, alkylthio, phenyl, formyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, alkanoyl (containing 2 to 4 carbon atoms), alkoxycarbonyl or thiazolidin-2-yl radical,
(b) an allyl, 2,3-dihydroxypropyl, 1,3-dihydroxyprop-2-yl, 2-formyl-2-hydroxyethyl, 3-formyloxy-2-hydroxypropyl, 2,3-bis-formyloxypropyl or 1,3-bis-formyloxyprop-2-yl radical,
(c) an alkyl radical containing 2 to 4 carbon atoms, which is substituted by a hydroxyl or carbamoyloxy radical, an alkanoyloxy radical (the alkanoyl part of which can be substituted by an amino, alkylamino or dialkylamino radical), an alkylsulphinyl, alkylsulphonyl, amino, alkylamino, dialkylamino, sulphoamino, alkylsulphonylamino or sulphamoylamino radical, an alkanoylamino radical (the alkanoyl part of which is optionally substituted by hydroxyl, amino, alkylamino or dialkylamino) or an alkox-

ycarbonylamino, ureido, alkylureido or dialkylureido radical,

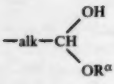
(d) a radical corresponding to one of the formulae:



or



or



in which alk is an alkylene radical containing 1 to 4 carbon atoms, X^{α} and Y^{α} are identical and represent oxygen or sulphur atoms and R^{α} represents an alkyl radical, or alternatively X^{α} and Y^{α} are identical or different and represent oxygen or sulphur atoms and the radicals R^{α} together form an alkylene radical containing 2 or 3 carbon atoms, and R^{β} represents a hydrogen atom or an alkyl radical containing 1 to 3 carbon atoms, or

(e) an alkyl radical containing 2 to 5 carbon atoms, which is substituted by an alkoxyimino or hydroxyimino radical,

(5) 1,4-dialkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl, 1-alkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl or 2-alkyl-5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl,

(6) 1,3,4-triazol-5-yl, 1,2,3-triazol-5-yl or 1-alkyl-1,2,4-triazol-5-yl which is unsubstituted or substituted in the 3-position by alkoxycarbonyl,

(7) (a) 1,3,4-thiadiazol-5-yl which is unsubstituted or substituted by an alkyl, trifluoromethyl, alkoxy or alkylthio radical, a hydroxyalkylthio radical, the alkyl part of which contains 2 to 4 carbon atoms, or an alkylsulphonyl, hydroxyl, hydroxyalkyl, carboxyl, carboxyalkyl, amino, alkylamino, dialkylamino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkanoylamino or alkanoylaminoalkyl radical, or

(b) 1,2,4-thiadiazol-5-yl substituted by an alkyl or alkoxy radical,

(8) (a) 1,3,4-oxadiazol-5-yl which is unsubstituted or substituted by an alkyl, trifluoromethyl, phenyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl or alkanoylaminoalkyl radical, or

(b) oxazol-2-yl or 4-alkyloxazol-2-yl, and

(9) tetrazol-5-yl which is unsubstituted or substituted in the 1-position by

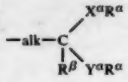
(a) an alkyl radical which is unsubstituted or substituted by alkoxy, sulpho, carboxyl, formyl or sulphamoyl,

(b) an alkyl radical containing 2 to 4 carbon atoms, which is substituted by hydroxyl, amino, alkylamino, dialkylamino, alkanoylamino, carboxyalkylamino, sulphamoylamino, sulphoamino, ureido, alkylureido or dialkylureido,

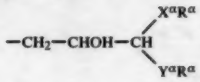
(c) an alkyl radical containing 2 to 5 carbon atoms, which is substituted by hydroxyimino or alkoxyimino,

(d) a phenyl, 2,3-dihydroxypropyl, 1,3-dihydroxyprop-2-yl, 2-formyl-2-hydroxyethyl, 3-formyloxy-2-hydroxypropyl, 2,3-bis-formyloxypropyl or 1,3-bis-formyloxyprop-2-yl radical, or

(e) a radical of the formulae:

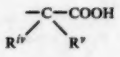


or



in which R^{β} is a hydrogen atom and X^{α}, Y^{α} and R^{α} are defined as under (4d) above,

and the symbol R^{*} represents a carboxyalkyl radical of the formula:



in which the radicals R^{iv} and R^{v}, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms, or alternatively

β. the symbol R is chosen from amongst:

1. 5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 1-position, 5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 2-position, or 1,2,4-triazol-5-yl or 3-alkoxycarbonyl-1,2,4-triazol-5-yl substituted in the 1-position, by

(a) an alkyl radical which is itself substituted by an alkoxy, alkylthio, phenyl, formyl, carbamoyl, alkylcarbamoyl or dialkylcarbamoyl radical, a hydroxyalkylcarbamoyl radical (the alkyl part of which contains 2 to 4 carbon atoms) or an alkanoyl (containing 2 to 4 carbon atoms), alkoxycarbonyl or thiazolidin-2-yl radical,

(b) an allyl, 2,3-dihydroxypropyl, 1,3-dihydroxyprop-2-yl, 2-formyl-2-hydroxyethyl, 3-formyloxy-2-hydroxypropyl, 2,3-bis-formyloxypropyl or 1,3-bis-formyloxyprop-2-yl radical,

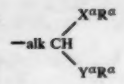
(c) an alkyl radical containing 2 to 4 carbon atoms, which is substituted by a hydroxyl or carbamoyloxy radical, an alkanoyloxy radical (the alkanoyl part of which can be substituted by an amino, alkylamino or dialkylamino radical), an alkylsulphinyl, alkylsulphonyl, amino, alkylamino, dialkylamino, sulphoamino, alkylsulphonylamino or sulphamoylamino radical, an alkanoylamino radical (the alkanoyl part of which is optionally substituted by hydroxyl, amino, alkylamino or dialkylamino) or an alkoxycarbonylamino, ureido, alkylureido or dialkylureido radical,

(d) a radical corresponding to one of the formulae mentioned above under (α. 4d), or

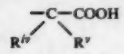
(e) an alkyl radical containing 2 to 5 carbon atoms, which is substituted by an alkoxyimino or hydroxyimino radical,

2. 5,6-dioxo-4-hydroxyalkylcarbamoylalkyl-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl, the hydroxyalkyl portion of which contains 2 to 4 carbon atoms, and

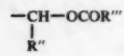
3. 1-alkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 4-position, 1-alkyl-5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 2-position, 2-alkyl-5,6-dioxo-1,2,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 1-position, or 4-alkyl-5,6-dioxo-1,4,5,6-tetrahydro-1,2,4-triazin-3-yl substituted in the 1-position, by a formylalkyl radical or by a radical of the formula:



in which alk, X^{α}, Y^{α} and R^{α} are defined as above, and the symbol R^{*} represents a hydrogen atom, an alkyl, vinyl or cyanomethyl radical or a radical of the formula:



as defined above, and the symbol R' represents a hydrogen atom or a radical which can easily be removed by an enzymatic method, of the formula:



in which R'' represents a hydrogen atom or an alkyl radical and R''' represents an alkyl radical or the cyclohexyl radical, it being understood that the alkyl or alkanoyl radicals and portions mentioned above are linear or branched (unless otherwise mentioned) and contain (unless otherwise mentioned) 1 to 4 carbon atoms, in its syn or anti forms and E or Z forms, and mixtures thereof, and also its addition salts with acids, its metal salts and its addition salts with nitrogen-containing bases.

15. A pharmaceutical antibacterial composition which comprises an antibacterial amount of a compound according to claim **1** in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,415,563

VEHICLE COMPOSITION CONTAINING 1-SUBSTITUTED AZACYCLONONAN-2-ONES

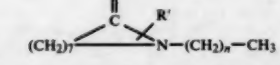
Vithal J. Rajadhyaksha, Mission Viejo, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Division of Ser. No. 137,248, Apr. 4, 1980, Pat. No. 4,316,893, which is a division of Ser. No. 725,490, Oct. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,247, Jun. 19, 1975, Pat. No. 3,989,816. This application Dec. 7, 1981, Ser. No. 328,035

Int. Cl.[3] **A61K** *7/44, 11/56, 31/33, 31/70, 31/71, 31/165, 35/195, 31/505*

U.S. Cl. 424—244 **11 Claims**

1. A composition useful for topically administering a physiologically active agent to a human or animal comprising an effective amount of a physiologically active agent and a nontoxic, effective penetrating amount of a compound having the structural formula



wherein n is 0–11 and R' is H or a lower alkyl group having 1–4 carbon atoms.

4,415,564

PHARMACEUTICAL PREPARATION FOR TREATING GLAUCOMA AND OCULAR HYPERTENSION

Giancesare Gamba, Nyon, Switzerland, and Luciano Bonomi, Verona, Italy, assignors to Dispersa AG, Winterthur, Switzerland

Filed Jun. 21, 1982, Ser. No. 390,110

Claims priority, application United Kingdom, Jun. 30, 1981, 8120141

Int. Cl.[3] **A61K** *31/33*

U.S. Cl. 424—244 **8 Claims**

1. Pharmaceutical composition for treating glaucoma and ocular hypertension, comprising guanethidine or a pharmaceutically acceptable salt thereof and terbutaline or a pharmaceutically acceptable salt thereof in relative quantities of 20:1 to 1:1.5 in an aqueous solution.

4,415,565

SILVER METACHLORIDINE IN TREATMENT OF INFECTIONS

Michael S. Wysor, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 135,059, Mar. 18, 1980, Pat. No. 4,384,117. This application Mar. 24, 1981, Ser. No. 246,984

Int. Cl.[3] **A61K** *31/555*

U.S. Cl. 424—245 **8 Claims**

1. A method for treating topical or systemic infections caused by bacteria, fungi species, viruses, or protozoa comprising the step of administering topically, intravaginally, parenterally, or orally to an infected animal an effective bactericidal, fungicidal, antiviral or protozoacidal amount of silver metachloridine.

4,415,566

CEPHALOSPORIN DERIVATIVES

Bernd Wetzel; Eberhard Woitun, both of Biberach; Wolfgang Reuter, Laupertshausen; Roland Maier, Biberach; Uwe Lechner, Ummendorf, and Hanns Goeth, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 163,194, Jun. 26, 1980, abandoned. This application Sep. 26, 1980, Ser. No. 191,423

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2938344

Int. Cl.[3] **C07D** *501/36;* **A61K** *31/545*

U.S. Cl. 424—246 **6 Claims**

4,415,567

7α-METHOXYCEPHALOSPORIN DERIVATIVES, AND ANTIBACTERIAL DRUGS CONTAINING THE SAME

Yoshimasa Machida, Wako; Isao Saito, Aza-Sori; Seiichiro Nomoto, Tokyo; Shigeto Negi, Kodaira; Hironori Ikuta, Tokyo, and Kyosuke Kitoh, Kawagoe, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

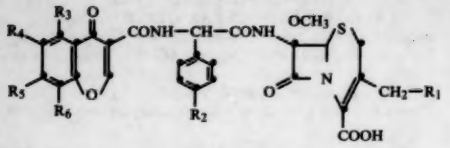
Division of Ser. No. 220,723, Dec. 29, 1980, Pat. No. 4,344,944. This application Feb. 18, 1982, Ser. No. 349,983

Claims priority, application Japan, Mar. 4, 1980, 55-26112; Jul. 8, 1980, 55-92199

Int. Cl.[3] **C07D** *501/57;* **A61K** *31/545*

U.S. Cl. 424—246 **5 Claims**

1. A 7α-methoxycephalosporin derivative represented by the formula



wherein R_1 represents lower alkanoyloxy; R_2 represents hydrogen or hydroxy; and R_3, R_4, R_5 and R_6 each represents a group selected from the class consisting of hydrogen, hydroxy, lower alkanoyloxy, methoxy, ethoxy, propoxy, methyl, ethyl, n-propyl, i-propyl, n-butyl, t-butyl, halogen, benzyloxy, phenethyloxy, nitro, methoxycarbonyloxy, ethoxycarbonyloxy and 2,2,2-trichloroethoxycarbonyloxy or a pharmaceutically acceptable salt thereof.

4,415,568

ISOXAZOLYL INDOLAMINES FOR TREATING DIABETES

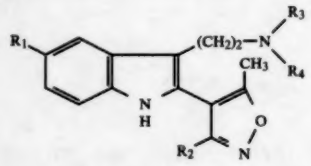
Leonard J. Brand, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 196,784, Oct. 14, 1980, Pat. No. 4,336,378, which is a continuation-in-part of Ser. No. 138,873, Apr. 10, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,187

Int. Cl.[3] **C07D** *413/04, 413/14;* **A61K** *31/42*

U.S. Cl. 424—248.4 **17 Claims**

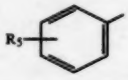
1. A pharmaceutical composition useful in treating diabetes comprising a compound of the formula



wherein

R_1 represents hydrogen, fluoro, chloro, lower alkyl having 1 to 4 carbon atoms, or lower alkoxy having 1 to 4 carbon atoms, and

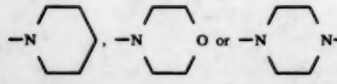
R_2 represents lower alkyl having 1 to 4 carbon atoms or



where R_5 represents hydrogen, fluoro, chloro, lower alkyl as defined above or lower alkoxy as defined above, and

R_3 and R_4 each independently represent lower alkyl as defined above, or

R_3 and R_4 together with N represent



or a pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier or diluent, said compound being present in an amount sufficient to provide a daily dose of 50 to 2000 milligrams of compound.

4,415,569

PYRAZOLOINDAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Fujimura Yasuo, Saitama; Tanaka Sadao; Matsunaga Isao, both of Tokyo; Yasuyuki Shiraki, Tokyo; Yugo Ikeda, Sayama; Tamotsu Yamazaki, Tokorozawa; Yasuhiro Ohba, Kawasaki; Kazushige Sakai, Tokyo; Shun-ichi Hata, Yokohama, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

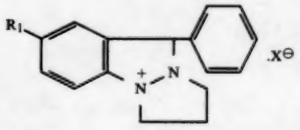
Filed Dec. 17, 1981, Ser. No. 331,896

Claims priority, application Japan, Dec. 26, 1980, 55-184106

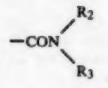
Int. Cl.[3] **A61K** *31/415;* **C07D** *487/04*

U.S. Cl. 424—248.57 **10 Claims**

1. A pyrazoloindazole derivative of the formula:

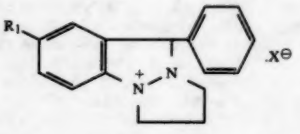


wherein R_1 is a cyano group, a carboxy group, a lower alkoxycarbonyl group or a group

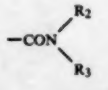


(wherein R_2 and R_3 are each a hydrogen atom, a lower alkyl group, a phenyl group which may have as a substituent a lower alkyl group having 1 to 4 carbon atoms, or when taken together with a nitrogen atom form a piperidino, piperazino, pyrrolidino or morpholino group); $X^{\ominus}$ is a counter ion.

10. A pharmaceutical composition having bronchodilating activity comprising an amount sufficient to effect bronchodilation of a compound of the formula:



wherein R_1 is a cyano group, a carboxy group, a lower alkoxycarbonyl group or a group



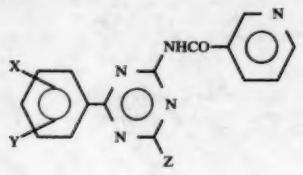
(wherein R_2 and R_3 are each a hydrogen atom, a lower alkyl group, a phenyl group which may have as a substituent a lower alkyl group having 1 to 4 carbon atoms, or when taken together with a nitrogen atom form a piperidino, piperazino, pyrrolidino or morpholino group), $X^{\ominus}$ is a counter ion; and a pharmaceutically acceptable carrier.

4,415,570
NICOTINIC ACID DERIVATIVES

Hiroshi Enomoto, Nagaokakyo; Akira Nomura, Hirakata; Yoshiaki Aoyagi, Otsu, and Yoshihisa Shibata, Kameoka, all of Japan, assignors to Nippon Shinyaku Co. Ltd., Japan

Filed Jun. 1, 1982, Ser. No. 383,703
Claims priority, application Japan, Jun. 5, 1981, 56-87124
Int. Cl.[3] A61K *31/53*; C07D *401/12*
U.S. Cl. 424—249 7 Claims

1. A compound of the formula



(I)

wherein

X is halogen, hydroxy, lower alkyl, lower alkenyl, lower alkoxy, nitro or amino;

Y is hydrogen, halogen, hydroxy, lower alkyl, lower alkenyl, lower alkoxy, nitro or amino; and

Z is mono-(lower alkyl)amino, di-(lower alkyl) amino, piperidino, piperazino, pyrrolidino, or morpholino.

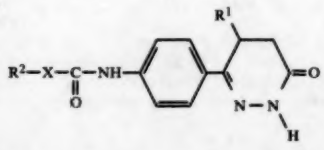
7. A method of treating a human or animal suffering from rheumatism or allergic nephritis, which comprises administering to the sufferer an effective amount of a compound or pharmaceutically acceptable salt thereof according to claim 1.

4,415,571
CARBAMATE DIHYDROPYRIDAZINONES, THEIR PREPARATION AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Marco Thyes, Lugwigshafen; Albrecht Franke, Wachenheim; Horst Koenig; Dieter Lenke, both of Ludwigshafen; Hans D. Lehmann, Hirschberg-Leutershausen, and Josef Gries, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 272,016
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022177; Sep. 8, 1980, 3033702
Int. Cl.[3] C07D *237/04*; A61K *31/50*
U.S. Cl. 424—250 4 Claims

1. A compound of the formula I



I

where X is oxygen or sulfur, R^1 is methyl and R^2 is alkyl of 1 to 4 carbon atoms which is unsubstituted or contains up to three chlorine, bromine or fluorine atoms, alkyl of 2 to 4 carbon atoms which is substituted by alkoxy of 1 to 3 carbon atoms which is separated from X by not less than two carbon atoms, alkyl of 1 to 3 carbon atoms which is substituted by cycloalkyl which has 3 to 6 carbon atoms in the ring and may or may not carry one or two alkyls of 1 to 3 carbon atoms, alkyl of 1 to 4 carbon atoms which is substituted by phenyl which itself is unsubstituted or substituted by one to three identical or different substituents chosen from alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, halogen, trifluoromethyl and nitro, cycloalkyl of 3 to 6 carbon atoms in the ring, which is unsubstituted or substituted by one to four alkyls of 1 to 4 carbon atoms, alkenyl of 3 to 5 carbon atoms, alkynyl of 3 to 5 carbon atoms or phenyl which is unsubstituted or substituted by one to three identical or different substituents chosen from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, trifluoromethyl, cyano and nitro.

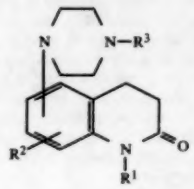
2. A therapeutic agent for treating thrombotic diseases which comprises: a pharmaceutically acceptable carrier or diluent for oral administration and an effective amount of a compound of the formula I of claim 1.

4,415,572
PIPERAZINYLCARBOSTYRIL COMPOUNDS

Michiaki Tominaga; Yung h. Yang; Hidenori Ogawa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,572
Claims priority, application Japan, Oct. 31, 1980, 55-154071
Int. Cl.[3] C07D *401/00*; A61K *31/495*
U.S. Cl. 424—250 27 Claims

1. A carbostyril compound of the formula (I)



(I)

wherein

R^1 represents a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, or a phenyl-lower alkyl group;

R^2 represents a hydrogen atom or a lower alkoxy group;

R^3 represents a hydrogen atom, a lower alkanoyl group, a furoyl group, a pyridylcarbonyl group, a lower alkanesulfonyl group, a lower alkoxycarbonyl group, a lower alkoxycarbonyl-lower alkyl group, a phenylsulfonyl group which may be substituted with a lower alkyl group on the benzene ring thereof, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a phenylcarbonyl group, a phenyl-lower alkyl group, or a phenyl-lower alkanoyl group where each of said phenylcarbonyl group, phenyl-lower alkyl group and phenyl-lower alkanoyl group may be substituted with 1 to 3 of a lower alkoxy group, a halogen atom, a lower alkyl group, a cyano group, a nitro group, an amino group, a hydroxy group, a lower alkanoylamino group, a lower alkylthio group and a lower alkanoyloxy group, or with a lower alkylenedioxy group on the benzene ring thereof; and

the bonding between the 3- and 4-positions of the carbostyril nucleus is a single bond or a double bond;

or its pharmaceutically acceptable salt.

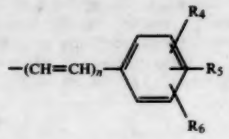
4,415,573
NOVEL URACIL DERIVATIVES, PROCESS FOR PREPARING THE SAME AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Kiyoshige Ochi, Kawagoe; Katsuhito Miyamoto, Tokyo; Hiroki Mitsui, Iruma; Yumiko Tsuruma; Isao Matsunaga, both of Tokyo; Takashi Matsuno, Omiya; Shigeru Takanashi, Asaka, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1981, Ser. No. 291,847
Claims priority, application Japan, Aug. 19, 1980, 55-112993
Int. Cl.[3] A61K *31/505*; C07D *239/10*
U.S. Cl. 424—251 10 Claims

1. An uracil derivative of the formula ,0390

wherein R_1 is a hydrogen atom, an alkyl group of 1–14 carbons, a cycloalkyl group of 3–8 carbons or



(wherein n is 0 or 1; R_4, R_5 and R_6 are the same or different and means a hydrogen atom, an alkyl group of 1–5 carbons, an alkoxy group of 1–6 carbons, an alkenyloxy group, a hydroxy group, an acyloxy group of 2–4 carbons, a halogen atom or a nitro group; and two of R_4, R_5 and R_6 may be taken together to form an alkylene dioxy group); R_2 is a hydrogen atom or an alkyl group of 1–5 carbons; R_3 is a hydrogen atom, an acyl group of 1–5 carbons, an unsubstituted or alkyl-substituted phenylsulfonyl group or an alkylsulfonyl group; and X is a hydrogen atom, a halogen atom or an alkyl group of 1–4 carbons which may be substituted with one or more halogen atoms, provided that when X is an alkyl, all of R_1, R_2 and R_3 are not a hydrogen atom simultaneously or two of said R_1, R_2, and R_3 are not hydrogen while a third is methyl simultaneously; and pharamaceutically acceptable salts thereof.

6. A pharmaceutical anti-tumor composition comprising an anti-tumor effective amount of an uracil derivative or its pharmaceutically acceptable salt according to claim 1 and a pharmaceutically acceptable diluent.

4,415,574

NOVEL SOLUBLE N_2 SUBSTITUTED DERIVATIVES OF 2,4-DIAMINO 5-BENZYL PYRIMIDINE, PROCESS FOR THEIR PREPARATION AND MEDICAMENTS CONTAINING THEM

Claude Laruelle, Villeneuve Loubet, and Marcel Lepant, Vence, both of France, assignors to S. A. Panmedica, Carros, France

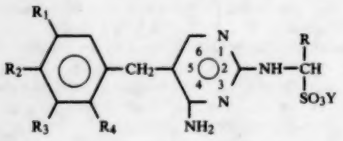
Filed Mar. 15, 1982, Ser. No. 358,260

Claims priority, application France, Mar. 20, 1981, 81 05592

Int. Cl.³ C07D *239/49, 401/12;* **A61K** *31/505*

U.S. Cl. 424—251 **39 Claims**

1. Novel soluble N_2 substituted derivative of 2,4-diamino 5-benzyl pyrimidine corresponding to the formula III:



(III)

in which:

R_1, R_2, R_3, R_4 which may be identical or different, represent a hydrogen atom, a halogen atom or an alkyl, thioalkyl, alkoxy or benzyloxy-,alkyloxyalkoxy group;

Y represents a hydrogen atom, an alkali metal or a pharmaceutically compatible organic base, and

R represents a hydrogen atom or a linear or branched alkyl radical of 1 to 7 carbon atoms, a cycloalkyl radical of 5 to 8 carbon atoms, an aromatic nucleus possibly substituted by halogen, nitro-, hydroxyl, dialkylamino-, alkoxy-, alkyl from C_1 to C_3, two adjacent substituents being able to constitute an alkyldioxy-ring or, a heterocyclic ring of furane, thiophene, or pyridine.

36. Medicament useful in human and/or veterinary medicine against bacteria, containing 50–1000 mg of at least one compound according to claim 1 in the pure state or in association with one or several other active principles and one or several compatible and pharmaceutically acceptable adjuvants or diluents.

4,415,575

SUPPRESSION OF GASTRIC ACID SECRETION USING PYRIMIDYLCARBAMATES

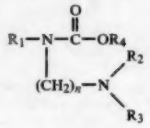
William A. Bolhofer, Frederick, and John D. Prugh, Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 137,061, Apr. 3, 1980, abandoned, which is a division of Ser. No. 20,147, Mar. 13, 1979, Pat. No. 4,226,871. This application Feb. 5, 1982, Ser. No. 345,957

Int. Cl.³ A61K *31/505*

U.S. Cl. 424—251 **2 Claims**

2. A composition for the suppression of gastric acid secretions which comprises a pharmaceutically inert carrier and an effective amount of a compound having the formula



wherein

n is 2 to 4;

R_1 is pyrimidyl, which may optionally be substituted with one, two or three of loweralkyl, halogen, trifluoromethyl, loweralkoxy, loweralkylthio, loweralkysulfonyl or mixtures thereof;

R_2 and R_3 are loweralkyl; and

R_4 is loweralkyl or phenyl and the pharmaceutically acceptable acid addition salts thereof.

4,415,576

METHOD FOR PREVENTING BODY FAT DEPOSITION IN MAMMALS

Ronald T. Stanko, Pittsburgh, Pa., assignor to Montefiore Hospital, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 249,812, Apr. 1, 1981, Pat. No. 4,351,835. This application Feb. 9, 1982, Ser. No. 346,181

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ A61K *31/12, 31/19, 31/525*

U.S. Cl. 424—252 **6 Claims**

1. A method for inhibiting body fat while increasing body protein concentration in a mammal, which comprises administering orally to said mammal effective amounts of a therapeutic mixture of pyruvate and dihydroxyacetone for a given diet.

4,415,577

BIS-SPARTEINE DERIVATIVES AND METHOD OF USING SAME IN THERAPY

Bernd Hachmeister; Wolfgang Kehrbach; Ulrich Kuehl, and Gerd Buschmann, all of Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

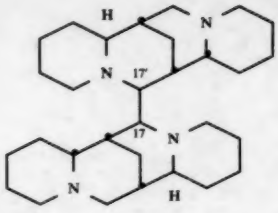
Filed Aug. 19, 1981, Ser. No. 294,207

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032219

Int. Cl.³ A61K *31/435;* **C07D** *471/22*

U.S. Cl. 424—258 **5 Claims**

1. A dimeric sparteine derivative selected from the group consisting of 17S,17'S-bissparteine of the Formula



and its physiologically compatible acid addition salts.

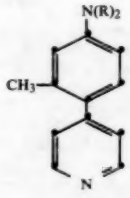
4,415,578

CARDIOTONIC 3-METHYL-4-(4-PYRIDINYL)BENZENEAMINE COMPOSITIONS AND METHOD OF USE

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

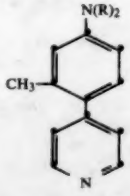
Filed Feb. 8, 1982, Ser. No. 347,086
Int. Cl.³ A61K *31/44*
U.S. Cl. 424—263 **5 Claims**

1. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally to such patient a medication in a solid or liquid dosage form containing, as the active component thereof, a cardiotonically effective amount of a compound having the formula:



where R is hydrogen or lower-alkyl or a pharmaceutically acceptale acid-addition salt thereof.

5. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically acceptable inert carrier and, as the active component thereof, an effective amount of a compound having the formula:



where R is hydrogen or a pharmaceutically acceptable acid-addition salt thereof.

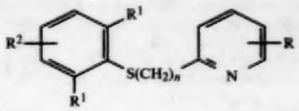
4,415,579

PYRIDINE DERIVATIVES

Roger Crossley, Reading, England, assignor to John Wyeth and Brother Limited, Maidenhead, England

Division of Ser. No. 232,451, Feb. 9, 1981, Pat. No. 4,337,259. This application Mar. 1, 1982, Ser. No. 353,556
Claims priority, application United Kingdom, Feb. 20, 1980, 8005669
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ A61K *31/44*; C07D *213/62, 213/28, 213/44*
U.S. Cl. 424—263 **3 Claims**

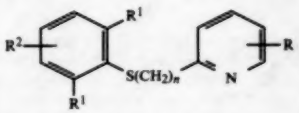
1. A compound of formula II



(II)

wherein R represents phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl or aralkyl of 7 to 12 carbon atoms, R^1 represents hydrogen or lower alkoxy, R^2 represents hydrogen, chloride or trifluoromethyl and n is 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

3. A method of treating ulcers or hypersecretion in a mammal, which method comprises orally administering to said mammal in need of such treatment an effective amount of a compound of formula I



(II)

wherein R represents phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl or aralkyl of 7 to 12 carbon atoms, R^1 represents hydrogen or lower alkoxy, R^2 represents hydrogen, chlorine or trifluoromethyl and n is 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

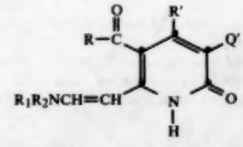
4,415,580

CERTAIN 2-(1H)-PYRIDINONES CARDIOTONIC COMPOSITIONS CONTAINING SAME AND METHOD OF USING SAME

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,454
Int. Cl.³ A61K *31/44*; C07D *213/50*
U.S. Cl. 424—263 **14 Claims**

1. 3-Q′-4-R′-5-(RCO)-6-[2-(di-lower-alkylamino)ethenyl]-2(1H)-pyridinone having the formula



or acid-addition salt thereof, where Q′ is hydrogen or cyano, R′ is hydrogen or methyl, and R, R_1 and R_2 are each lower-alkyl.

11. A method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically effective amount of the 3-Q′-4-R′-5-(RCO))-

6-[2-(R_1R_2N)-ethenyl]-2(1H)-pyridinone of claim 1 or pharmaceutically acceptable acid-addition salt thereof, where R', R, R_1 and R_2 have the meanings given in claim 1 and Q' is hydrogen.

4,415,581

1-[3-6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-4-HYDROXY-4-PHENYLPIPERIDINES TO TREAT PSYCHOSES

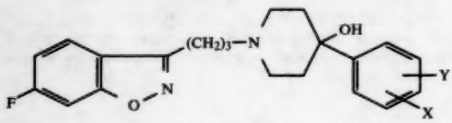
Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 366,247, Apr. 9, 1982, Pat. No. 4,396,770. This application May 18, 1983, Ser. No. 495,905

Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **10 Claims**

1. A method of treating psychoses comprising administering to a mammal in need of psychoses treatment a psychoses treating effective amount of a compound of the formula



wherein X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, halogen or trifluoromethyl; Y is hydrogen or trifluoromethyl with the proviso that Y is hydrogen when X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, or trifluoromethyl and Y is hydrogen or trifluoromethyl when X is halogen; the optical antipode thereof; or a pharmaceutically acceptable acid addition salt thereof.

4,415,582

METHOD OF TREATING ULCERS OR HYPERSECRETION

Roger Crossley, and Kay H. Dickinson, both of Reading, England, assignors to John Wyeth and Brother Limited, Maidenhead, England

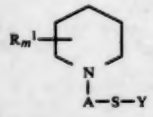
Division of Ser. No. 217,925, Dec. 18, 1980, Pat. No. 4,343,805, which is a continuation of Ser. No. 98,421, Nov. 29, 1979, abandoned. This application Feb. 24, 1982, Ser. No. 351,837

Claims priority, application United Kingdom, Dec. 16, 1978, 48813/78

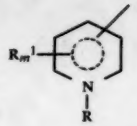
Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **2 Claims**

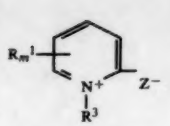
1. A method of treating ulcers or hypersecretion in a mammal which comprises administering to said mammal an effective anti-ulcer amount of a compound of formula I



wherein Y is



(V)



(VII)

wherein R is hydrogen or lower alkyl, R^1 is hydrogen, lower alkyl, hydroxylower alkyl, loweralkoxyloweralkyl, loweralkoxy, halogen, formyl, phenyl, phenylalkyl or $CH(OR^4)_2$ where R^4 is lower alkyl or two R^4 radicals are joined to form a lower alkylene chain, m is 1 or 2, the dotted lines in formula V represent an optional double bond in one of the indicated positions, the nitrogen atom carrying a positive charge when a double bond is in the position adjacent thereto, A is an alkylene radical having from 1 to 6 carbon atoms, which may be substituted by lower alkyl of 1 to 6 carbon atoms, S is sulphur, R^3 is loweralkyl, phenyl or aralkyl of 7 to 12 carbon atoms, Z^- is an anion, or a pharmaceutically acceptable acid addition salt thereof, with the proviso that when more than one R^1 radical is present in the molecule then the R^1 radicals may be the same or different.

4,415,583

PROCESS FOR INDUCING HYPNOSIS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 134,596, Mar. 27, 1980, abandoned, which is a continuation of Ser. No. 26,937, Apr. 4, 1979, abandoned, which is a continuation of Ser. No. 910,562, May 30, 1978, abandoned, which is a continuation of Ser. No. 821,591, Aug. 4, 1977, abandoned, which is a continuation of Ser. No. 729,294, Oct. 4, 1976, abandoned, which is a continuation of Ser. No. 284,160, Aug. 28, 1972, abandoned. This application Mar. 25, 1981, Ser. No. 247,424

Int. Cl.³ A61K *31/41*

U.S. Cl. 424—269 **4 Claims**

1. A process for inducing sleep comprising the administration to a human or animal subject in need of said treatment, in unit dosage form, from about 0.007 mg. to about 0.5 mg./kg. body weight of 1-hydroxmethyl-6-(o-chlorophenyl)-4H-s-triazolo[4,3-a][1,4]benzodiazepine or the pharmacologically acceptable acid addition salt, acetate or hydrogen succinate ester, or (5) N-oxide thereof in association with a pharmaceutical carrier.

4,415,584

3-OXO-6-OXA-2-AZATRICYCLO 5.4.2. UNADECENE-4-CARBOXYLATE

Eric Hunt, Betchworth, England, assignor to Beecham Group Limited, England

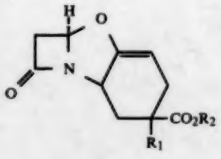
Filed Jan. 25, 1979, Ser. No. 6,436

Claims priority, application United Kingdom, Feb. 2, 1978, 4152/78

Int. Cl.³ C07D *498/04;* A61K *31/42*

U.S. Cl. 424—272 **66 Claims**

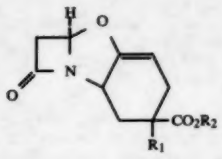
1. A compound of the formula (II):



(II)

wherein R_1 is hydrogen or alkyl of 1 to 4 carbon atoms and CO_2R_2 is carboxyl or a pharmaceutically acceptable salt thereof.

26. A pharmaceutical composition useful for effecting β-lactamase inhibition in mammals including humans which comprises a β-lactamase inhibitory amount of a compound of the formula (II):



(II)

wherein R_1 is hydrogen or alkyl of 1 to 4 carbon atoms and CO_2R_2 is carboxyl or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4,415,585

CONTRACEPTIVE METHOD

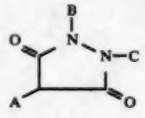
Cathy L. Joyce, Oak Park, and Lourens J. D. Zaneveld, Chicago, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Mar. 11, 1982, Ser. No. 357,160

Int. Cl.³ A61K *31/53, 31/415*

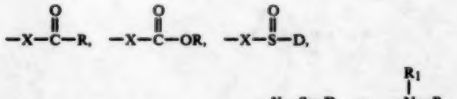
U.S. Cl. 424—273 P **6 Claims**

1. A method for inhibiting conception in a female mammal which comprises maintaining in the genital tract of said mammal an effective amount of a compound having the formula



wherein

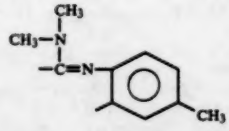
A is hydrogen, halo, trihalomethyl, lower alkyl, —X—OH,



X is a lower alkylene group,

R, R_1, and R_2 are hydrogen, or the same or different lower alkyl groups, and

B, C, and D, which can be the same or different, are phenyl, hydroxyphenyl or lower alkylphenyl, further provided that B and C together can form the chain



4,415,586

COMBATING FUNGI WITH ACYLATED IMIDAZOLYL-GAMMA-FLUOROPINACOLYL DERIVATIVES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Jörg Stetter, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

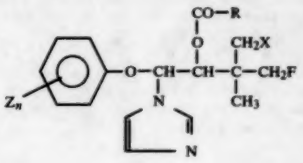
Continuation of Ser. No. 187,867, Sep. 17, 1980, abandoned. This application May 10, 1982, Ser. No. 376,802

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1979, 2938575

Int. Cl.³ A01N *43/50, 59/16;* **C07D** *23/60;* **C07F** *15/00*

U.S. Cl. 424—273 R **8 Claims**

1. A compound of the formula



in which

R represents straight-chain or branched alkyl with 1 to 8 carbon atoms, straight-chain or branched alkenyl or alkynyl with in either case 2 to 4 carbon atoms, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, alkoxy with 1 to 4 carbon atoms, alkoxyalkyl with 1 to 4 carbon atoms in each alkyl part, cycloalkyl with 5 to 7 carbon atoms, optionally substituted phenyl or phenylalkyl or phenoxyalkyl which are optionally substituted in the phenyl part and have in each case up to 2 carbon atoms in the alkyl part, the substituents in the phenyl part in the last three cases being selected from halogen, cyano, nitro and alkyl and alkoxy with in either case 1 to 2 carbon atoms, or R represents alkylamino with 1 to 12 carbon atoms, dialkylamino with 1 to 4 carbon atoms in each alkyl part, halogenoalkylamino with up to 4 carbon atoms and up to 5 identical or different halogen atoms, alkoxycarbonylamino with 1 to 4 carbon atoms in the alkyl part, alkoxyalkylamino with 1 to 4 carbon atoms in each alkyl part or optionally monosubstituted or polysubstituted phenylamino, the substituents being selected from halogen, nitro, cyano, straight-chain or branched alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio with in either case 1 or 2 carbon atoms and up to 5 identical or different halogen atoms and alkoxycarbonylalkenyl with 1 to 4 carbon atoms in the alkyl part and 2 to 4 carbon atoms in the alkenyl part,

X represents hydrogen or fluorine,

Z represents halogen, cyano, nitro, straight-chain or branched alkyl with up to 4 carbon atoms, cycloalkyl with 5 to 7 carbon atoms, halogenoalkyl with up to 2 carbon atoms and up to 5 halogen atoms, alkoxycarbonyl with a total of up to 5 carbon atoms, alkoxy or alkylthio with in either case up to 2 carbon atoms or optionally substituted phenyl or phenoxy, the substituents being selected from halogen, amino, cyano, nitro and alkyl with 1 to 2 carbon atoms, or Z represents optionally substituted phenylalkyl with 1 to 2 carbon atoms in the alkyl part, the substituent in the alkyl part being alkylcarbonyloxy with a total of up to 3 carbon atoms, and each substituent in the phenyl part being halogen, nitro or cyano, and

n represents 0, 1, 2, 3, 4 or 5, or an acid addition salt with a hydrogen halide acid, phosphoric acid, nitric acid, sulphuric acid, a sulphonic acid or a monofunctional or bifunctional carboxylic or hydroxycarboxylic acid, or a complex thereof with a metal salt, of which the metal is copper, zinc, manganese, magnesium, tin, iron or nickel

and of which the anion is halide, nitrate, sulphate or phosphate.

6. A fungicidal composition containing as active ingredient a fungidically effective amount of a compound, salt or complex according to claim 1 in admixture with a diluent.

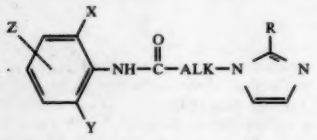
7. A method of combating fungi comprising applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound, salt or complex according to claim 1.

4,415,587
METHOD OF USE OF ANTIARRHYTHMIC 1-ARYLCARBAMOYLALKYL IMIDAZOLE DERIVATIVES, COMPOSITION

Julius Diamond, Mountain Lakes; Thomas K. Morgan, Jr., and Ronald A. Wohl, both of Morris Plains, all of N.J., assignors to Berlex Laboratories, Inc., Cedar Knolls, N.J.

Division of Ser. No. 275,172, Jun. 19, 1981, Pat. No. 4,353,921. This application Aug. 12, 1982, Ser. No. 407,400
Int. Cl.³ A61K *31/415*
U.S. Cl. 424—273 R **2 Claims**

1. The method for the suppression of cardiac arrhythmia in an animal which comprises administering to said animal an amount effective for the suppression of said arrhythmia of a compound according to the formula:



wherein

R = C_1–C_8 alkyl, phenyl, substituted phenyl, C_3–C_7 cycloalkyl, C_4–C_8 cycloalkylalkyl;

X = C_1–C_4 alkyl, fluoro, chloro, bromo, trifluoromethyl;

Y = hydrogen, C_1–C_4 alkyl, fluoro, chloro, bromo;

Z = hydrogen, hydroxy, fluoro, chloro, bromo, methyl, C_1–C_4 alkoxy, C_1–C_4 acyloxy;

ALK = straight or branched chain alkylene having up to 8 carbon atoms, and the pharmaceutically acceptable acid addition salts thereof.

4,415,588
THERAPEUTICAL METHOD OF TREATING PATIENTS WITH IMPAIRED IMMUNE SYSTEM

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Jul. 8, 1982, Ser. No. 396,279
Claims priority, application Italy, Jul. 9, 1981, 48866 A/81
Int. Cl.³ A61K *31/22, 31/205*
U.S. Cl. 424—311 **3 Claims**

1. The method of stimulating the immune system of living animals by enhancing mitogenic stimulation, B- and T-lymphocyte cooperation, and cell chemotaxis which comprises orally or parenterally administering to an animal in need of such enhancement an effective amount of acetylcarnitine.

4,415,589
USE OF CARNITINE AND OF LOWER ACYL-CARNITINES IN THE THERAPEUTIC TREATMENT OF THE PATHOLOGY OF THE VEINS

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Nov. 1, 1982, Ser. No. 438,012
Claims priority, application Italy, Nov. 6, 1981, 49655 A/81
Int. Cl.³ A61K *31/22, 31/205*
U.S. Cl. 424—311 **3 Claims**

1. A therapeutical method for the treatment of a patient affected by venous stasis which comprises orally or parenterally administering to said patient a therapeutically effective amount of carnitine, a lower acyl-carnitine wherein the acyl radical contains from 2 to 4 carbon atoms or a pharmaceutically acceptable salt thereof.

4,415,590
HERPES TREATMENT

Koert Gerzon, Indianapolis, Ind., assignor to BetaMED Pharmaceuticals, Inc., Indianapolis, Ind.

Filed Apr. 26, 1982, Ser. No. 372,176
Int. Cl.³ A61K *31/195*
U.S. Cl. 424—319 **7 Claims**

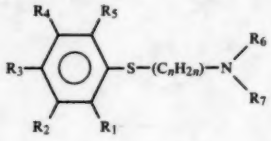
1. A method for the control of herpes virus infections in man which comprises contacting the herpes lesions, topically or by injection, with a dose of L-lysine L-glutamate effective to control the said infections.

4,415,591
USE OF AMINOALKYL PHENYL SULFIDE DERIVATIVES FOR THE TREATMENT OF HYPERTENSION

Sheldon W. May, Atlanta, Ga.; Robert S. Phillips, Gaithersburg, Md.; Heath H. Herman, Chamblee, and Patricia W. Mueller, Decatur, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Jun. 4, 1981, Ser. No. 270,247
Int. Cl.³ A61K *31/10*
U.S. Cl. 424—330 **8 Claims**

1. A method for treating hypertension in mammals comprising administering to said mammal an effective amount of an aminoalkyl phenyl sulfide having the formula:



wherein

(C_nH_{2n}) = a linear or branched alkyl chain of 10 carbons or less (n = 1–10);

R_1, R_2, R_3, R_4, R_5 = H, OH, C_1–C_4 alkyl, C_1–C_4-alkoxy, F, Cl, Br, or I;

R_6, R_7 = H, C_1–C_4-alkyl;

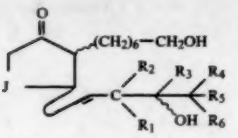
or a pharmaceutically acceptable salt thereof.

4,415,592
15-DEOXY-16-HYDROXY PROSTAGLANDINS FOR PRODUCING BRONCHODILATION

Harold C. Kluender; Warren D. Woessner, and William G. Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 215,802, Dec. 12, 1980, Pat. No. 4,331,688, which is a division of Ser. No. 973,010, Dec. 26, 1978, Pat. No. 4,275,224, which is a division of Ser. No. 880,501, Feb. 23, 1978, Pat. No. 4,132,738. This application Mar. 12, 1982, Ser. No. 357,428
Int. Cl.³ A61K *31/12*
U.S. Cl. 424—331 **14 Claims**

1. A therapeutic method for producing bronchodilation in an individual for whom such therapy is indicated, comprising: administering to the individual an effective bronchodilating amount of a compound having the formula:

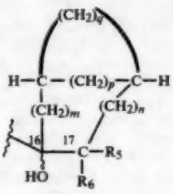


wherein:

J is selected from the group consisting of R-hydroxymethylene and S-hydroxymethylene;

R_1 and R_2 are hydrogen;

R_3 is selected from the group consisting of hydrogen and methyl, or together with R_4 is a methylene or a lower alkylated methylene chain of 2 to 5 carbon atoms such that a cycloalkyl or a lower alkylated cycloalkyl of 4 to 7 carbon atoms inclusive is formed, or together with R_4 is a bicycloalkyl or bicycloalkenyl moiety having the formula:



such that a bicycloalkyl or bicycloalkenyl compound is formed, wherein m and n are integers having a value of from 0 to 3, p is an integer having a value of from 0 to 4 and q is an integer having a value of from 1 to 3 and wherein the double bond of such dicycloalkenyl is in the m, n, p or q bridge;

R_4 together with R_3 forms a cycloalkyl or a lower alkylated cycloalkyl, bicycloalkyl or bicycloalkenyl as defined above, or together with R_5 is a methylene chain of 3 to 4 carbon atoms such that a cycloalkyl of 4 to 5 carbon atoms inclusive is formed;

R_5 is selected from the group consisting of hydrogen, straight-chain alkyl having from 1 to 3 carbon atoms or together with R_4 forms a cycloalkyl as defined above; and

R_6 is selected from the group consisting of hydrogen or straight-chain alkyl having from 1 to 3 carbon atoms.

4,415,593

CHEWING GUM BASE

Michael Glass, Flushing; Edwin R. Koch, Garden City, and Vincent Corsello, Albertson, all of N.Y., assignors to Warner Lambert Company, Morris Plains, N.J.

Filed Apr. 28, 1982, Ser. No. 372,599

Int. Cl.³ A23G *3/30*

U.S. Cl. 426—4 **5 Claims**

1. A chewing gum base for use in producing chewing gum having improved non-stick chewing qualities comprising a natural polyisoprene rubber, inorganic fillers, plasticizers, non-toxic vinyl polymer, emulsifying agents and solvents for the rubber components wherein the improvement comprises the use of a polyisoprene rubber obtained from the guayule shrub.

4,415,594

MANUFACTURE OF CHEESE

Jozeph Czulak, South Yarra, and Leslie A. Hammond, Beaumaris, both of Australia, assignors to Australian Diary Corporation, Melbourne, Australia

Filed Dec. 30, 1981, Ser. No. 335,495

Claims priority, application Australia, Feb. 6, 1981, PE7502/81

Int. Cl.³ A23C *19/032, 19/045, 19/072*

U.S. Cl. 426—36 **6 Claims**

1. A process of making cheese comprising the steps of adding *Streptococcus thermophilus* together with one or more bacteria selected from the group consisting of *Streptococcus lactis, Streptococcus cremoris,* and *Streptococcus diacetilactis,* and rennet to milk to produce a coagulum, cutting the coagulum to produce a curd-whey mixture, stirring the curd-whey mixture and effecting a first cooking by raising the temperature gradually to about 38° C. over a period of 35 to 45 minutes and maintaining that temperature for about 25 minutes, draining off about one half of the whey and effecting a second cooking by raising the temperature of the residual whey and curd over a period of about 10 minutes to a temperature between 40° C. and 49° C. and maintaining that temperature for about 25 minutes, draining the residual whey from the curd and cheddaring the drained curd at a temperature between 40° C. and 49° C. for about 30 minutes, cutting the cheddared curd into large pieces and salting, stirring, and compressing the curd pieces into blocks.

4,415,595

MARSHMALLOW FROZEN CONFECTION

Toshio Takemori, Tokyo; Masateru Kato, Urawa, and Fumio Masuda, Showa, all of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,406

Claims priority, application Japan, Nov. 29, 1980, 55-167385

Int. Cl.³ A23G *3/00, 9/00*

U.S. Cl. 426—101 **1 Claim**

1. A food product comprising in combination a marshmallow exterior and a frozen confection interior said marshmallow having a multi-cellular structure retentive of shape, elasticity and softness when stored at a temperature below −15° C. and consisting essentially of 20 to 25 wt.% water, at least 60 wt.% sugar and the remainder gelatine, said frozen confection being selected from the group consisting of ice cream and sherbert, and wherein said frozen confection is embedded in and covered completely by said marshmallow exterior.

4,415,596

COATED CONFECTIONERY WITH A HIGH PROTEIN CONTENT AND PROCESS FOR PRODUCTION THEREOF

Geert Andersen, and Manfred Lemke, both of Halle in Westfalen, Fed. Rep. of Germany, assignors to August Storck KG, Fed. Rep. of Germany

Continuation of Ser. No. 134,412, Mar. 27, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,694

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912412

Int. Cl.³ A23G *00/00*

U.S. Cl. 426—103 **6 Claims**

1. A partially coated confectionery having a protein content of from 10 to 50 percent by weight, comprising a core of a paste-like compound rich in protein, wherein the protein is in the form of hydrophobed protein particles, and a coating of a fat containing pliable, soft caramel compound partially coating and surrounding the core such that the coated confectionery is in disc-like configuration with the core thereof being optically contrasted with the coating.

4,415,597

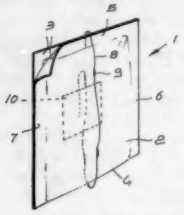
FILTER-BAG FOR INFUSION PRODUCTS

Andrea Romagnoli, S. Lassare di Savena, Italy, assignor to Ima-Industria Macchine Automatiche-S.p.A., Emilia, Italy

Continuation of Ser. No. 95,544, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 685,031, May 10, 1976, abandoned. This application Oct. 22, 1980, Ser. No. 199,682

Int. Cl.³ B65B *29/04*

U.S. Cl. 426—394 **1 Claim**



1. A method of making a bag for infusion products such as tea which comprises the steps of:

(a) folding a rectangular blank of filter paper coated with a thermoplastic layer in half along a fold line so that two juxtaposed sections of said blank have their thermoplastic layers facing one another;

(b) inserting one end of a natural-fiber string between edges of said sections opposite said fold line and winding said string around said fold line so that said string lies along the filter paper of one of said sections and extends only partly across the filter paper of the other of said sections;

(c) heat sealing the opposite end of said string between layers of a folded tag free from attachment to said sections;

(d) providing an infusion product between said sections and heat sealing said sections together along edges thereof to form a bag and secure said one end to said bag; and

(e) at a plurality of locations on each of said sections thermally fusing thermoplastic material of said sections and bonding the thermally fused thermoplastic material through the respective filter paper to said string whereby said string is detachably held to said bag at said locations, a length of said string between said tag and the one of said locations proximal to said opposite end remaining free of attachment to said other of said sections whereby said length hangs loosely from the bag.

4,415,598

METHOD OF PROCESSING DOUGH TO INCREASE ITS BAKED SPECIFIC VOLUME

Rocky W. Chen, Brooklyn Park; Leah G. Evans, Minneapolis; Deena G. Hohle, St. Louis Park; Charles H. Turpin; Samuel H. Yong, both of Minneapolis; Barry S. Mikulski; David A. Kirk, both of Plymouth; Gerald T. Tracy, Wayzata, and Raymond W. Tucker, Bloomington, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,583

Int. Cl.³ B65D *85/00, 81/20*

U.S. Cl. 426—394 **3 Claims**

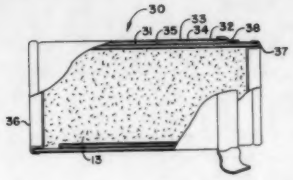
1. A method of processing dough to increase its baked specific volume, said method comprising:

forming a farinaceous dough which is at least partially chemically leavened and placing said dough in a container and allowing said dough to remain pressurized at a pressure of at least about 5 psi,

storing said container and dough at a temperature of about 40° F.,

opening said container to effect removal of the contained dough from the container,

and controlling the opening of the container such that the pressure of the dough is released at a rate of less than



about 10 psi per second with the said time of release of pressure being at least about 2 seconds.

4,415,599

GRAVY OR SAUCE MIX

Kari E. O. Bos, Valencia, Calif., assignor to Carnation Company, Los Angeles, Calif.

Filed May 13, 1982, Ser. No. 377,776

Int. Cl.³ A23L *1/195, 1/40*

U.S. Cl. 426—578 **5 Claims**

1. In a dry mix composition comprising a starch-containing thickening agent, flavoring, coloring and nutritional agents which upon addition to water reconstitutes to form a gravy or sauce, the improvement which consists essentially of including in the dry mix from 15% to 45% by weight of said thickening agent, and maltodextrin in an amount sufficient to provide a weight ratio of maltodextrin to thickening agent of at least 1:1, whereby the dry mix may be added to boiling water to form a gravy or sauce substantially free of lumps.

4,415,600

SPRAY DRIED COFFEE WHITENERS WITH REDUCED MILK PROTEIN

Donald E. Miller, Strongsville, and Charles E. Werstak, Medina, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,110

Int. Cl.³ A23C *11/08*

U.S. Cl. 426—613 **8 Claims**

1. A dried coffee whitener comprising on a dry weight basis

about 25–50% of a vegetable oil which is normally solid at room temperature;

about 2.5–5.5% of a casein-containing protein;

a buffering agent in an amount effective to prohibit feathering;

at least about 1% of an emulsifying agent for improved whitening;

the remainder being essentially carbohydrate;

said emulsifying agent being a blend consisting essentially of a partial glycerol ester which is normally hard or plastic at room temperature and an ionic emulsifier selected from the group consisting of sodium or calcium lactylated esters of fatty acids and sodium stearyl fumarate, said partial glycerol ester and ionic emulsifier being present in the amounts of about 0.7—3% and about 0.1–3%, respectively, based on the dry weight of the formulation.

4,415,601

QUICK HARDENING ICING COMPOSITION

John A. Eckel, 2286 Edythe Dr., Dunedin, Fla. 33528

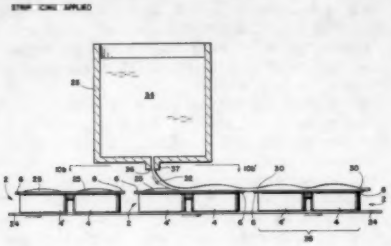
Continuation of Ser. No. 151,185, May 19, 1980, abandoned. This application May 3, 1982, Ser. No. 374,115

Int. Cl.³ A23G *3/00*

U.S. Cl. 426—659 **5 Claims**

1. In a quick-hardening icing composition capable of application to still warm, baked, bakery goods and subsequent

immediate wrapping without substantial adherence of the icing to the wrapping due to the icing's ability to quick harden and capable of also providing a barrier to penetration of any residual moisture from the bakery goods to the icing, said composition including sugar, a stabilizer, an emulsifier, whey, vegetable starch powder, water, and fats, the improvement comprising:



said composition including between 8.6 and 16.9 wt % whey, between 9.8 and 14.5 wt % vegetable starch powder, between 3.3 and 5.9 wt % high melting point fat and between 37.8 and 44.9 wt % sugar,

said wt % being based upon the entire quick hardening icing composition.

4,415,602

REACTIVE PLATING METHOD AND PRODUCT

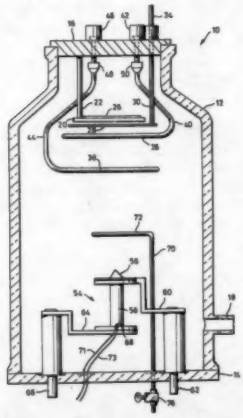
Don E. Brodie, St. Agatha, Canada, and John H. Morgan, Munich, Fed. Rep. of Germany, assignors to Canadian Industrial Innovation Centre/Waterloo, Waterloo, Canada

Filed Apr. 5, 1982, Ser. No. 365,116

Claims priority, application Canada, Jul. 24, 1981, 382527

Int. Cl.³ B05D *1/34, 1/36*

U.S. Cl. 427—39 **26 Claims**



1. A method of coating a substrate comprising:

providing a vacuum chamber communicating with a surface of the substrate to be coated;

producing a glow discharge in the vacuum chamber in contact with said substrate surface;

vaporizing coating material in said chamber; and

introducing a gas into the vacuum chamber to react with said vaporized coating material forming a compound to be deposited on the substrate by the glow discharge.

4,415,603

PROCESS FOR PAINTING WHICH CAN BE USED FOR MARKING ROADS

Catherine Valiot, Compiegne; Francis Lemaire, Bagnols-sur-Ceze, and Gilbert Gaussens, Meudon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 19, 1981, Ser. No. 294,356

Claims priority, application France, Aug. 28, 1980, 80 18682

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **6 Claims**

1. A process for painting a substrate which comprises applying to the substrate a coating of a paint containing

(a) a polymerizable binder comprising from about:

15 to 50% by weight of a reactive prepolymer selected from the group consisting of epoxy acrylate resins, urethanacrylate resins, polyester-acrylate resins and unsaturated acrylic resins;

10 to 60% by weight of monounsaturated monomers;

5 to 50% by weight of polyunsaturated monomers;

0.1 to 10% by weight of at least one photoinitiator; and

(b) from about 0.1 to 10% by weight, based on the binder, of a peroxide, and from about 0.1 to 10% by weight, based on the binder, of a metal salt selected from the group consisting of ferrous sulphate, stannous chloride and Mohr's salt; the metal salt and the peroxide being added to the binder at substantially the time of application of the coating of paint; and irradiating the thus applied coating with ultraviolet rays.

4,415,604

CONFORMAL COATING AND POTTING SYSTEM

Larry A. Nativi, Rocky Hill, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Nov. 12, 1982, Ser. No. 441,164

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **18 Claims**

1. A one-part coating composition, especially useful for conformal coating and potting, comprising:

(1) At least one isocyanate-capped polyether diol and triol;

(2) An acrylate or methacrylate reactive diluent; and

(3) A polymerization initiator of the photo-initiator type.

14. A method of forming a uv curing polymerizable conformal coating or potting on a substrate wherein said substrate has one or more shadow areas, comprising the steps in sequence of:

(1) providing a polymerizable coating composition which comprises at least one isocyanate-capped polyether diol and triol, an acrylate or methacrylate reactive diluent, and a polymerization initiator of the photo-initiator part;

(2) applying said coating composition to said substrate;

(3) exposing the coated substrate to uv light of wave length and intensity to effect uv cure of exposed areas of said coating; and

(4) storing said coated substrate under conditions of temperature and humidity such as to promote curing of unexposed (shadow) areas of said coating through a built-in secondary cure mechanism.

4,415,605

SCINTILLATOR SCREEN METHOD OF MANUFACTURE

Vincent L. Davis, Milwaukee, and Raymond J. D. Smith, Pewaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 24, 1980, Ser. No. 200,408

Int. Cl.³ G01J *1/58*

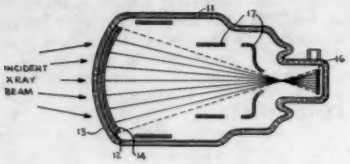
U.S. Cl. 427—65 **37 Claims**

1. An improved method of depositing a phosphor material on a substrate to produce an image screen for receiving radiation and responsively emitting light comprising the steps of:

(a) providing a planetary rotation apparatus on the central axis of and within the confines of a vacuum evaporator;

(b) attaching at least one substrate to the rotation apparatus

such that the substrate is radially displaced from the central axis of an evaporator; and



(c) evaporating phosphor while the substrate is rotated to thereby obtain an image screen having a thickness greater at its edge than at its center.

4,415,606

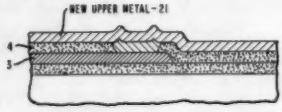
METHOD OF REWORKING UPPER METAL IN MULTILAYER METAL INTEGRATED CIRCUITS

Thomas E. Cynkar, Centerville, and James G. House, Kettering, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 10, 1983, Ser. No. 456,689

Int. Cl.³ C23F *1/02*; B44C *1/22*; B05D *5/12*; C03C *15/00*

U.S. Cl. 427—90 **4 Claims**



1. An upper level metal rework process for a multilevel metal integrated circuit wafer having multilevel metal conductors joined by vias through dielectric layers, comprising the steps of:

forming a photoresist mask layer over each metal via, said mask having a dimension nominally greater than said via;

etching the upper level metal with an etchant that does not materially etch the dielectric, until the etched region of the upper level metal just enters the recessed region of the via;

removing the masking photoresist;

sputter etching the wafer in an evacuated chamber; and

depositing a new layer of upper level metal without exposing the sputter etched wafer to atmospheric ambients.

4,415,607

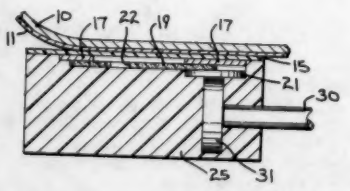
METHOD OF MANUFACTURING PRINTED CIRCUIT NETWORK DEVICES

Oscar L. Denes, Greendale; Lynn R. Kiphart, Milwaukee, and Paul P. Szalewski, Grafton, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 13, 1982, Ser. No. 417,001

Int. Cl.³ H05K *3/20*

U.S. Cl. 427—96 **8 Claims**



8. A method of manufacturing an electrical resistor network package comprising the sequential steps of:

providing a temporary support member having a release surface;

printing indicia areas in reverse format on said release surface;

depositing an insulating primary substrate layer over said indicia and on said release surface;

depositing defined conductor areas of conductive material to the exposed surface of said primary substrate layer;

depositing defined resistor areas of resistive material to the exposed surface of said primary substrate layer with portions of the resistor areas overlying respective conductor areas;

depositing defined terminal contactor areas of conductive material overlying portions of said resistor areas;

removing portions of said resistor areas to trim said areas to a predetermined resistive value;

joining said temporary support member to a permanent support member with the said substrate layer and its aforestated pre-applied areas in facing relationship with a supporting surface of said permanent support member; and

releasing and removing said temporary support member from said primary substrate layer.

4,415,608

CONTINUOUS PRODUCTION OF POLYMETHYLPENTENE MEMBRANES

Bonnie J. Epperson; Lowell J. Burnett, both of San Diego, Calif., and Verne D. Helm, Plains, Mont., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 15, 1982, Ser. No. 339,812

Int. Cl.³ B32B *5/16*

U.S. Cl. 427—244 **10 Claims**

1. A process for the continuous production of a polymethylpentene membrane which comprises dissolving said polymethylpentene in an organic solvent, placing the resultant solution in a container, continuously passing a microporous support into said container and through and in direct contact with said solution, said support being in contact on one side thereof with a moving roller whereby only one side of said support is in contact with said solution, transferring polymethylpentene from said solution to said one side of the support, continuously withdrawing the resulting polymer-coated support from said container, evaporating said solvent and continuously recovering the resultant polymethylpentene membrane.

4,415,609

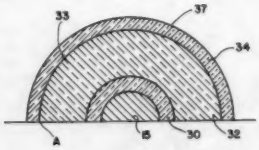
METHOD OF APPLYING A CARBON-RICH SURFACE LAYER TO A SILICON CARBIDE FILAMENT

Harold E. Debolt, Boulder, Colo.; Raymond J. Suplinskas, Haverhill, Mass.; James A. Cornie, North Chelmsford, Mass.; Thomas W. Henze, Lawrence, Mass., and Albert W. Hauze, Chelmsford, Mass., assignors to Avco Corporation, Wilmington, Mass.

Division of Ser. No. 173,773, Jul. 30, 1980, Pat. No. 4,340,636. This application May 5, 1982, Ser. No. 374,992

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—249 **5 Claims**



1. A method of applying a carbon-rich surface layer to a silicon carbide filament comprising:

supplying an elongated reactor through which a filament

substrate moves, said reactor having an entrance port through which a hydrocarbon and silane mixture is supplied to vapor deposit stoichiometric silicon carbide on the substrate filament;

an intermediate exit port for removing said mixture;

a lower entrance port below said intermediate exit port through which a hydrocarbon and silane blend is supplied to flow counter to the movement of the filament to the exit port; and

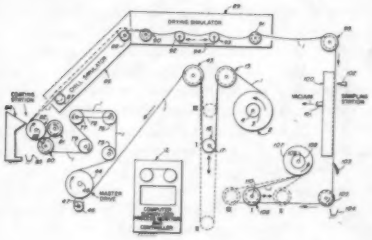
adjusting the vapor deposition rates of the hydrocarbon and silane blend so that the percentage of unreacted silane in the blend relative to unreacted hydrocarbon decreases as the blend moves from the lower entrance port to the exit port.

4,415,610

PROCESS SIMULATOR

Edward J. Choinski, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 4, 1981, Ser. No. 260,331
Int. Cl.³ G03C *1/76*
U.S. Cl. 427—372.2 **7 Claims**



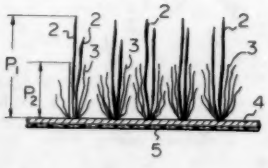
1. The method of simulating the coating and drying of a continuously moving web, comprising the steps of moving an elongated strip of web at constant speed past a coating station while applying a uniform wet coating to said web, stopping said web, and sweeping a stream of drying air over the stationary web with an air velocity component lengthwise of the web to simulate the drying of a continuously moving web.

4,415,611

ARTIFICIAL FUR HAVING GUARD HAIR FIBERS AND UNDER FUR FIBERS AND A METHOD FOR MANUFACTURING THE SAME

Seiichi Yamagata, and Masaaki Sakai, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 300,963
Claims priority, application Japan, Sep. 22, 1980, 55-130786
Int. Cl.³ A01N *1/00*
U.S. Cl. 428—15 **40 Claims**



1. An aritifical fur comprising;

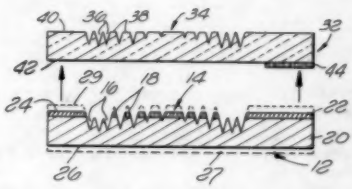
a ground construction and numerous units of pile fibers projected upward from said ground construction, said unit of pile fibers provided with a yarn-like bundle of a root portion, at least a main part of said root portion firmly locked in said ground construction, said pile fibers of each unit being separated from each other from the position above said root portion, said pile fibers being made from fibrous materials and provided with varied lengths thereof in a range from almost zero to almost identical to the maximum length of said fibrous materials, each unit of pile fibers comprising a group of fibers having tapered top end portions and a group of fibers substantially shorter and thinner than the above-mentioned fiber group, the first group functioning as guard hairs and the second group functioning as under fur and in the pile fabric, the yarn for the ground construction of the pile fabric and the yarn for the pile fibers are different, and, in the pile fabric said root portion of the yarn for creating the pile fibers maintains its yarn structure in the ground construction thereof.

4,415,612

DOUBLE ENGRAVED IDENTIFICATION CARD

John S. Hall, and Barry C. Phelps, both of Sacramento, Calif., assignors to California Interface and Software Limited Partnership, Sacramento, Calif.

Filed Jan. 11, 1982, Ser. No. 338,788
Int. Cl.³ B44F *1/10*
U.S. Cl. 428—29 **12 Claims**



1. A double engraved identification card for use with an opaque masking member comprising:

a first planar member having a first major surface with a first image engraved thereon and a second major surface opposite the first major surface;

a translucent second planar member having a first major surface with a second image engraved thereon, and a second major surface opposite the first major surface, the second engraved image coinciding with the first engraved image when the second planar member is aligned with the first planar member; and

means for affixing the first and second planar members together with the first and second engraved images in coincidence whereby a slot is provided between the first and second planar member transversely adjacent the first and second engraved images for removeably receiving the opaque planar member in the slot for masking one of the first and second engraved images from view.

4,415,613

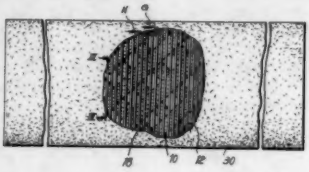
METHOD FOR MAKING STRENGTHENED POROUS PIPE AND RESULTING PRODUCT

Jonas Medney, 3504 Woodward St., Oceanside, N.Y. 11572

Filed Aug. 24, 1981, Ser. No. 295,640
Int. Cl.³ B32B *31/00*
U.S. Cl. 428—36 **14 Claims**

1. A method of forming perforated pipe comprising winding, on a mandrel having multiple spaced protrusions thereon, fibers forming angularly related strips arranged between the said protrusions, said strips cooperatively defining openings through which said protrusions extend, and impregnating said fibres with a settable plastic which combined with the fibres forms a tube adequate to resist a pressure of the order of magnitude of at least about 600 p.s.i., the strips being arranged in two

sets, the strips of one set being angularly related to the strips of the other set, said plastic being selected from the group consisting of epoxy resin, polyesters and vinyl esters, the fibres being of fibre glass, 23–50% of the total combined weight of the plastic and fibres being constituted by the weight of the plastic, said method furthermore comprising arranging screening over



the openings, and forming at least part of the screening of grains which are stuck together with resin applied in an amount insufficient to fill all of the spaces between the grains, said method further comprising coiling a further strip around the tube beneath the screening thereon to prevent the screening from passing into the openings.

4,415,614

DECORATIVE HOLLOW VITREOUS ARTICLE AND METHOD OF MAKING SAME

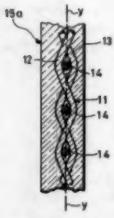
Axel von Loewis of Menar, Bochum, Fed. Rep. of Germany, assignor to Herner Glas Bernd Hoffbauer, Herne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 164,531, Jul. 2, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 355,900

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927112

Int. Cl.³ C03B *23/20;* **B32B** *17/12;* **B44F** *1/06*

U.S. Cl. 428—38 **5 Claims**



1. A method of making a hollow vitreous article with a decorative pattern, comprising the steps of:

(a) providing a flexible woven fabric of glass fibers forming intersecting warp and weft threads;

(b) cutting said fabric to a size fitting into a given blow mold;

(c) placing the cut fabric in said blow mold;

(d) blowing a glass parison in said mold into contact with said fabric with at least partial penetration of the interstices of said fabric by the expanding glass mass whereby at least portions of said fibers are embedded in said mass;

(e) reheating said parison with the fabric adhering thereon into a blowable state;

(f) expanding the reheated parison and fabric by a further blow into a body of predetermined final shape; and

(g) allowing said body to cool.

5. An article made by the method of claim **1, 2, 3** or **4.**

4,415,615

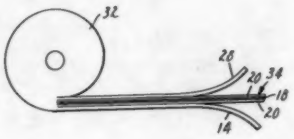
CELLULAR PRESSURE-SENSITIVE ADHESIVE PRODUCT AND METHOD OF MAKING

Donald L. Esmay, Coon Rapids; Gordon G. Johnson, Lake Elmo, both of Minn., and George F. Vesley, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation-in-part of Ser. No. 339,405, Jan. 15, 1982. This application Jun. 1, 1982, Ser. No. 383,582

Int. Cl.³ B32B *27/16, 7/06, 7/12, 31/28*

U.S. Cl. 428—40 **14 Claims**



1. Pressure-sensitive adhesive product comprising a cellular pressure-sensitive adhesive membrane surrounding and thereby defining a multiplicity of small voids, contituting from 15% to 85% of the volume of said membrane,

the cellular adhesive membrane, when compressed ⅓ of its void thickness and released after 30 seconds, being characterized by the feature that it experiences a recovery above the line 10 on FIG. 1 of the drawing within 60 seconds after release.

5. Pressure-sensitive adhesive product as defined in claim **1** wherein the backing is flexible and has a low-adhesion surface from which the cellular membrane is readily removable.

4,415,616

SLAB FOR FLOORING

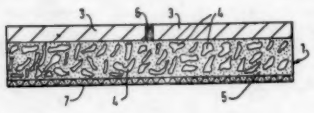
Attilio Angioletti, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Jul. 8, 1981, Ser. No. 281,694

Claims priority, application Italy, Jul. 25, 1980, 23685 A/80

Int. Cl.³ B32B *3/14, 5/30*

U.S. Cl. 428—48 **11 Claims**



1. A slab for making a flooring, comprising:

a plurality of tiles;

a plate of synthetic resinous material, said resinous material having the form of a matrix, said plate having a first face and a second face, said faces being opposite each other, said plurality of tiles being bonded to said first face;

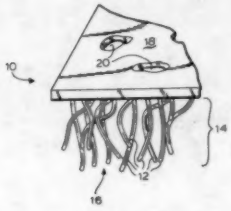
a sound insulating material dispersed in said matrix of resinous material, said insulating material having the form of shavings; and

means for stiffening said slab, said means comprising a reinforcing fabric embedded in the second face of said plate, whereby said slab can be prepared prior to its placement on a floor, thereby reducing the laying time of the flooring.

4,415,617
BASE FABRIC FOR THE MANUFACTURE OF EMBROIDERY AND LACE AND METHOD OF ITS PREPARATION

Conrad A. D'Elia, New Milford, Conn., assignor to Trustee for David Roth, New York, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,513
Int. Cl.³ B32B *3/24, 5/28;* **D04H** *1/54, 11/00*
U.S. Cl. 428—86 **5 Claims**



1. A formed fabric, which comprises;
a web having an upper and a lower surface and a body therebetween having a plurality of water-soluble, thermoplastic, synthetic polymeric resin staple fibers;
said fibers being homogeneously distributed throughout said web and interlocked together;
said lower surface having a plurality of exposed individual fibers and fiber ends and said upper surface comprising a gas permeable film, integral with underlying fibers and comprising thermoplasticized and rehardened, flattened fibers and portions of fibers.

5. A method of manufacturing an improved formed fabric, useful as a base cloth for the making of lace, which comprises;
providing a planar web having upper and lower surfaces and a body made up of a plurality of water-soluble, thermoplastic, synthetic polymeric resin staple fibers, said fibers being homogeneously distributed throughout the web and mechanically interlocked together, said interlocking being of the character achieved with needled staple fibers;
said web having a weight of from 2.0 to 3.0 oz/sq. yd;
calendering the web under sufficient heat, pressure and humidity to thermoplasticize the fibers on the upper surface only of said web, whereby there is obtained a discontinuous, gas permeable film having a thickness of from about 3 to about 5 mils.

4,415,618
NON-SLIDABLE BOTTOM SURFACE LAYER FOR A FLOOR COVERING

Eugene F. McClung, Jr., 49 La Senda, South Laguna, Calif. 92677

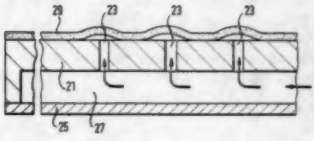
Continuation-in-part of Ser. No. 318,687, Nov. 5, 1981, Pat. No. 4,377,610. This application Jan. 6, 1983, Ser. No. 456,301
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.³ B32B *33/00*
U.S. Cl. 428—88 **6 Claims**

1. A bottom surface layer for a floor covering which includes a base and a top surface layer, said bottom surface layer comprising:
a. a flat member having a first surface and a second surface, with said first surface being fixedly coupled to the base of the floor covering wherein said flat member is formed out of a fabric material;
b. a plurality of bristles which are electro-staticly flocked onto said second surface of said flat member over the full surface of said flat member; and
c. bonding means for permanently bonding said plurality of bristles to said second surface of said flat member, whereby said plurality of bristles lock into a carpet on a floor and prevent lateral sliding of the floor covering when the feet of a sitting person produce downward and lateral forces on the floor covering.

4,415,619
WORKPIECE PALETTE

Egon Füglein, Aachen, Fed. Rep. of Germany, assignor to Sachs Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 58,206, Jul. 17, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,779
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831893; Jul. 20, 1978, 2831894
Int. Cl.³ B65D *19/44;* **B32B** *5/14*
U.S. Cl. 428—131 **5 Claims**



1. A workpiece palette for transporting workpieces between work stations, comprising a palette plate having a plane surface for receiving the workpieces, said plate carrying a polyurethane adhesive coating, said coating being thicker than 0.35 mm wherein said adhesive coating directly contacts the surface of said palette plate, said adhesive coating having two surfaces, the surface of the coating which faces away from said palette plate having a lower adhesive strength than the other surface and wherein said palette plate forms a plurality of ducts which open into the surface carrying said adhesive coating and communicates with a fluid supply source.

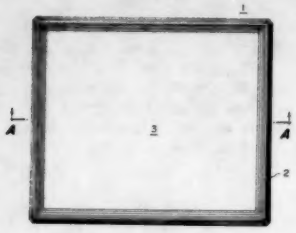
4,415,620
MAT BASE PLATE

Ken Yamazaki, Hyogo; Yosuke Yamamoto, Osaka; Takehisa Kinoyama, Osaka, and Kinichi Sasagawa, Osaka, all of Japan, assignors to Duskin Franchise Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1980, Ser. No. 157,078
Claims priority, application Japan, Oct. 11, 1979, 54-140678[U]; Oct. 11, 1979, 54-140679[U]; Oct. 11, 1979, 54-140680[U]
Int. Cl.³ A47L *23/22;* **B32B** *7/06*
U.S. Cl. 428—157 **17 Claims**

1. For underlying and bordering a door mat, a mat base plate, comprising:
a generally flat plate portion having an upwardly-presented floor; and
a rim perimetrically surrounding said flat plate portion, said rim having an apical ridge lying above said floor;
said rim further including an inner slope portion extending downwardly and inwardly from said apical ridge to said floor;
means defining a plurality of substantial generally concentric frame-like surface disontinuities arranged in a series on said inner slope portion, so that when a door mat with the same general shape in plan as said floor, but a larger size than said floor and a smaller size than said apical ridge, is

placed on said mat base plate, it will be noticeably framed at least by said apical ridge and, depending on its size, by



part of said inner slope portion preferably including at least one of said frame-like surface discontinuities.

4,415,621

USE OF α,α-BIS(DIALKYLAMINOBENZYLIDENE) KETONE DYES IN OPTICAL RECORDING ELEMENTS

Donald P. Specht, and Harold T. Thomas, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 124,382, Feb. 25, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,761

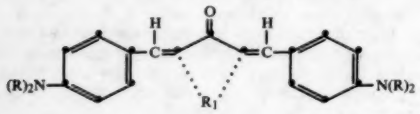
Int. Cl.³ B41M *5/24;* **G01D** *15/34*

U.S. Cl. 428—172 **10 Claims**

1. A recording element comprising a support having coated thereon a layer of an amorphous composition comprising a binder and a dye, wherein:

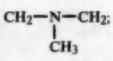
said amorphous composition has an absorption factor of at least 20 at 488 nm and

said dye conforms to the structure:



wherein

R_1 is $(CH_2)_n$ or



n is an integer from 0–5 and each R is independently selected from the group consisting of straight- and branched-chain alkyl groups of about 1–6 carbon atoms.

4,415,622

FUSIBLE INTERLINING OF IMPROVED BOND STRENGTH AND DRY CLEANING RESISTANCE

Dattatraya V. Kamat, Jenkintown, Pa., assignor to Kayser-Roth Corporation, New York, N.Y.

Filed Nov. 2, 1982, Ser. No. 438,595

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 **12 Claims**

1. A fusible interlining having enhanced bond strength with resistance to dry cleaning and comprising a support web and a heat activatable adhesive carried by said support web, said adhesive comprising polyethylene having a melt index of at least about 60, a density of at least about 0.91 and a relatively narrow molecular weight distribution, as expressed by having a MW:MN ratio of no more than about 4.

4,415,623

DECORATION OF SHEET MATERIAL

Robert J. Schlaepfer, St. Gallen, Switzerland, assignor to Jacob Schlaepfer & Co. AG, St. Gallen, Switzerland

Continuation of Ser. No. 916,176, Jun. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 866,114, Dec. 30, 1977, abandoned, which is a continuation of Ser. No. 614,709, Sep. 18, 1975, Pat. No. 4,071,387. This application Sep. 29, 1980, Ser. No. 191,741

Claims priority, application United Kingdom, Sep. 19, 1974, 40872/74; Apr. 15, 1975, 15444/75

Int. Cl.³ B32B *3/18;* **B41M** *3/12;* **B44C** *1/16*

U.S. Cl. 428—200 **4 Claims**

1. A decorative article for application to a sheet material comprising:

a rigid decorative shape selected from a group consisting of stones and metal shapes and having at least a first surface and a second surface,

a layer of a heat activatable low-melting thermoplastic adhesive applied to said first surface of said shape, and

a heat stable carrier sheet of non-heat-pressure sensitive release material adhesively releasably adhered to said second surface of said shape, said carrier sheet including a non-woven fabric of regenerated cellulose fibers bonded together by non-thermoplastic binders having a melting point greater than 200° C.,

said article being adapted to be positioned with said first surface juxtaposed to said sheet material whereupon application of heat and pressure to said heat stable carrier sheet activates said low-melting thermoplastic adhesive and produces bonding of said article to said sheet material,

the carrier sheet being removed after said bonding has occurred thereby maintaining registration of said article.

4,415,624

AIR-FIREABLE THICK FILM INKS

Ashok N. Prabhu, Plainsboro, and Kenneth W. Hang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 280,936, Jul. 6, 1981, abandoned. This application Jan. 3, 1983, Ser. No. 455,310

Int. Cl.³ B32B *3/10;* **H01B** *1/02*

U.S. Cl. 428—209 **24 Claims**

1. In an air-fireable conductor or resistor ink suitable for forming a film on a porcelain-coated metal circuit board comprising from about 2 to about 90 percent by weight of a functional component, from about 1 to about 80 percent by weight of a glass frit and from about 8 to about 35 percent by weight of a suitable organic vehicle, wherein the functional component in the resistor ink is ruthenium dioxide and the functional component in the conductor ink is a precious metal in combination with bismuth oxide, wherein bismuth oxide is present in admixture with the precious metal or as a component of the glass;

the improvement wherein the glass frit consists of from about 40 to about 55 percent by weight of barium oxide, from about 10 to about 15 percent by weight of calcium oxide, from about 14 to about 25 percent by weight of boron trioxide, and from about 13 to about 23 percent by weight of silicon dioxide.

15. In an assembly comprising a porcelain-coated metal circuit board having on a portion of the surface thereof a coating of an air-fireable conductor or resistor ink comprising from about 2 to about 90 percent by weight of a functional

component, from about 1 to about 80 percent by weight of a glass frit and from about 8 to about 35 percent by weight of a suitable organic vehicle, wherein the functional component in the resistor ink is ruthenium dioxide and the functional component in the conductor ink is a precious metal in combination with bismuth oxide, wherein bismuth oxide is present in admixture with the precious metal or as a component of the glass,

the improvement wherein the glass frit consists of from about 40 to about 55 percent by weight of barium oxide, from about 10 to about 15 percent by weight of calcium oxide, from about 14 to about 25 percent by weight of boron trioxide, and from about 13 to about 23 percent by weight of silicon dioxide.

21. In an electronic assembly comprising a porcelain-coated metal circuit board having a circuit thereon, said circuit containing a resistor film or conductor film formed by applying and firing in air a resistor or conductor ink comprising from about 2 to about 90 percent by weight of a functional component, from about 1 to about 80 percent by weight of a glass frit and from about 8 to about 35 percent by weight of a suitable organic vehicle, wherein the functional component in the resistor ink is ruthenium dioxide and the functional component in the conductor ink is a precious metal in combination with bismuth oxide, wherein bismuth oxide is present in admixture with the precious metal or as a component of the glass,

the improvement wherein said glass frit consists of from about 40 to about 55 percent by weight of barium oxide, from about 10 to about 15 percent by weight of calcium oxide, from about 14 to about 25 percent by weight of boron trioxide, and from about 13 to about 23 percent by weight of silicon dioxide.

4,415,625

SPIRAL LINKAGE BELT AND METHOD OF MAKING SAME

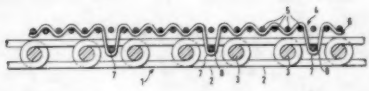
Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 443,054

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147115

Int. Cl.³ D04H *3/02*

U.S. Cl. 428—222 **8 Claims**



1. A spiral linkage belt comprising: a multiplicity of intermeshing plastic helices with the windings of each helix entering between the windings of an adjacent helix to form a passageway; and a pintle wire extending through each said passageway and connecting the helices forming that passageway; and said belt being characterized in that it further includes a fabric of interwoven structural warp wires and weft wires secured to said helices.

4,415,626

ANTISTATIC COMPOSITION AND ELEMENTS AND PROCESSES UTILIZING SAME

Charles R. Hasenauer, Rochester, and Donald N. Miller, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,401

Int. Cl.³ B32B *5/16, 27/36;* **G03C** *1/82*

U.S. Cl. 428—323 **17 Claims**

1. A substantially transparent electrographic image-receiving element comprising a substantially transparent polymeric support having on each side thereof a non-tacky, electrically conductive layer, each of said electrically conductive layers comprising (a) a film-forming binder; (b) a hardener for said binder; (c) a substantially transparent matting agent having particles with a diameter in the range of from about 1 to about 50 microns; (d) a highly electrically conductive, noncrystallizable conductivity agent; and (e) a charge control agent.

4,415,627

CHEMICALLY RESISTANT THERMOSENSITIVE RECORDING PAPER

Masahiro Miyauchi, Tokyo; Sadao Morishita, Ibaraki; Fumio Okumura, Kunitachi, and Masahiro Higuchi, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,779

Claims priority, application Japan, Dec. 23, 1980, 55-182557; Jan. 7, 1981, 56-981

Int. Cl.³ B41M *5/18*

U.S. Cl. 428—332 **4 Claims**

1. A chemically resistant thermosensitive recording paper, consisting of (a) a dye precursor and (b) a color developer capable of coloring said dye precursor on heating as principal consituent elements, characterized in that an alginate overcoat layer is provided as the topmost layer thereof.

4,415,628

MOISTURE VAPOR PERMEABLE SHEET MATERIALS

Gheorge Cioca, Coatesville; George F. Feeley, Downingtown, both of Pa.; Joseph B. Brabson, Wilmington, Del., and Peter Barth, Neuwied, Fed. Rep. of Germany, assignors to Seton Company, Newark, N.J.

Filed Oct. 26, 1981, Ser. No. 314,536

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—335 **11 Claims**

1. A moisture vapor permeable sheet material comprising:

a homogeneous admixture of a synthetic polymeric material and a protein, said sheet material being moisture vapor permeable and nonpenetrable to liquid water and having a pressure sensitive adhesive coated on one side thereof; said pressure sensitive adhesive being comprised of a synthetic organic polymer adhesive, and said protein being selected from the group consisting of collagen and elastin and derivatives of collagen and elastin.

4. The sheet material of claim **1** wherein said pressure sensitive adhesive is present at a thickness of 0.5 to 1.5 mils.

4,415,629

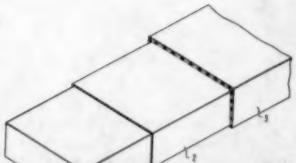
INSULATED CONDUCTOR

Anthony J. Palumbo, Hermitage; Henry A. Pearce, Jr., Stoneboro, and Curtis L. Moore, Hermitage, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 22, 1982, Ser. No. 360,737

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—375 **10 Claims**



1. A method of making an insulated conductor comprising:

(1) coating said conductor with a aryl-triazole; and

(2) applying an insulating coating to said coated conductor.

6. An insulated conductor having a coating of a aryl-triazole in between a coating of insulation and said conductor.

4,415,630

PROCESS OF MAKING MAGNETIC RECORDING MEDIUM

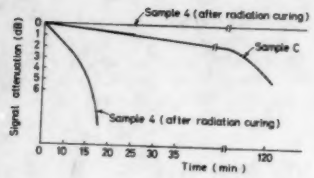
Yuichi Kubota; Masaharu Nishimatsu, and Kazushi Tanaka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 269,391, Jun. 1, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,180

Claims priority, application Japan, Jun. 10, 1980, 55-78223; Jun. 10, 1980, 55-78227

Int. Cl.[3] B32B 5/16; H01F 10/02

U.S. Cl. 428—403 11 Claims



1. A magnetic recording medium comprising a substrate and a magnetic recording layer formed thereon, characterized in that said magnetic recording layer is made of a magnetic coating material consisting essentially of a magnetic powder dispersed in a binder, said magnetic coating material containing a titanium coupling agent.

4,415,631

POROUS INORGANIC SUPPORT MATERIAL COATED WITH AN ORGANIC STATIONARY PHASE, FOR USE IN CHROMATOGRAPHY, AND PROCESS FOR ITS PREPARATION

Jan A. J. Schutijser, Dieren, Netherlands, assignor to Akzo, Arnhem, Netherlands

Filed Jun. 29, 1981, Ser. No. 278,864

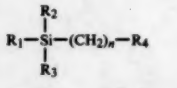
Claims priority, application Netherlands, Jun. 27, 1980, 8003727

Int. Cl.[3] B32B 5/16, 9/00; B01J 3/02

U.S. Cl. 428—405 17 Claims

1. A support material, usable as such in chromatography or as a starting material which, upon linkage to it of compounds containing ionic groups, ligands or biomacromolecules, can be used as ion exchanger, as a medium in affinity chromatography or in enzymatic reactions, consisting of porous, inorganic silanized particles onto which there is covalently bonded an organic, stationary phase built up of (co)polymerized vinyl monomers and containing amide groups, characterized in that

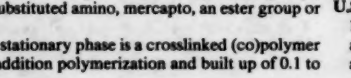
(a) a hydroxyl-containing inorganic material has been silanized with an organo silane of the formula I



(I)

wherein n=1-5; R_1 is halogen or alkoxy (1-10 C); R_2 and R_3 are each halogen, alkoxy (1-10 C), alkyl (1-3 C) or aryl (6-10 C), the halogen and alkoxy group in R_1, R_2 and R_3 being capable of forming an —O—Si-bond between the silane and the inorganic material through its surface hydroxyl groups; and R_4 is amino, substituted amino, mercapto, an ester group or glycidoxy; and

(B) the organic stationary phase is a crosslinked (co)polymer obtained by addition polymerization and built up of 0.1 to 140 μmoles of vinyl monomers per m^2 inorganic surface of the support material, said (co)polymer containing at least 0.1 μmoles amide groups per m^2 inorganic surface of the support material, and said vinyl monomers consisting wholly or partly of bifunctional vinyl monomers containing amide groups and having the formula II



(II)

wherein R_5 and R_6 each are hydrogen or an organic group having up to 18 carbon atoms; R_7 is hydrogen or an organic group up to 20 carbon atoms; and m is an integer from 1 to 20.

4,415,632

SILICON CARBIDE BODY HAVING PORES FILLED WITH STEEL OR STEEL ALLOYS

Hartmut Luhleich, Düren, and Francisco J. Dias, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Division of Ser. No. 233,474, Feb. 11, 1981. This application Mar. 7, 1983, Ser. No. 472,660

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005586

Int. Cl.[3] B32B 9/00, 15/04

U.S. Cl. 428—408 1 Claim

1. Armor plate resistant to bending, shear and crushing forces and consisting of composite material consisting of a porous silicon carbide body in a molded armor plate shape, having through-penetrating pores filled with a metallic material selected from the group consisting of steel and steel alloys, whereby the composite material has hardness and stiffness due to the silicon carbide and toughness due to the metallic material in a combination sufficiently stress-resistant to provide resistance to explosive impact.

4,415,633

HEAT-SENSITIVE RECORDING MATERIAL

Sukenori Nakamura; Akira Igarashi, and Hiroharu Matsukawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1981, Ser. No. 291,153

Claims priority, application Japan, Aug. 12, 1980, 55/110942

Int. Cl.[3] B41M 5/18

U.S. Cl. 428—411 3 Claims

1. A heat-sensitive recording material comprising a heat-sensitive color forming layer on a base, said color forming layer containing an electron donating colorless dye and an organic acid to which a heat-fusible substance having a melting point in the range of from 60° C. to 150° C. and being miscible with said organic acid is fusion-bonded, said fusion-bonding being effected at a temperature lower than the melting point of the heat-fusible substance and in a water medium.

4,415,634

MAGNETIC DISK SUBSTRATE WITH A CORE OF SYNTHETIC MATERIAL

Holger Hinkel, Boeblingen; Ulrich Kuenzel, Kusterdingen; Erhard Max, Sindelfingen, and Jochen Schneider, Gaertringen-Rohrau, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1982, Ser. No. 381,246

Claims priority, application European Pat. Off., Jul. 23, 1981, 81105823.9

Int. Cl.[3] G11B 5/14

U.S. Cl. 428—579 3 Claims

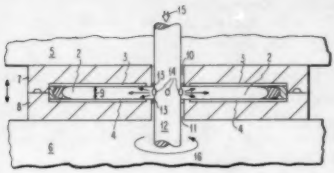
1. A magnetic recording disk comprising

an annular core of synthetic material,

at least one thin metal foil bonded to a face of said core, the

outer surface of said foil forming a magnetic recording media-receiving surface,

the inner surface of said foil which is bonded to said core being provided with a relatively soft layer of copper,



said copper layer being an electro-plated layer applied to said metal foil before said foil is bonded to said core, and a magnetic recording layer on said recording media-receiving surface.

4,415,635

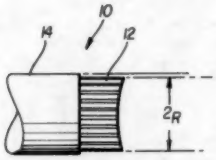
ELECTRIC BRUSH

Doris Wilsdorf; Heinz G. F. Wilsdorf, and Charles M. Adkins, III, all of Charlottesville, Va., assignors to The University of Virginia, Charlottesville, Va.

Filed Apr. 9, 1980, Ser. No. 138,716

Int. Cl.³ H01R *39/00*

U.S. Cl. 428—611 **33 Claims**



1. An electrical brush for making an electrical connection to an object having a predetermined shape, comprising:

an electrically conductive matrix material;

plural metal fiber wires embedded in said matrix material and defining a longitudinal axis, said fiber wires having a diameter (d), a length (l) extending from said matrix material, and a packing density (f) defined as the ratio of the total cross-sectional area of the fiber wires relative to the cross-sectional area of the matrix material in a plane cutting the longitudinal axis of said fiber wires, wherein

$$1\ \mu m < d < 120\ \mu m \quad (a)$$

$$(d/l) < 0.05 \quad (b)$$

$$1\% < f < 25\% \quad (c)$$

4,415,636

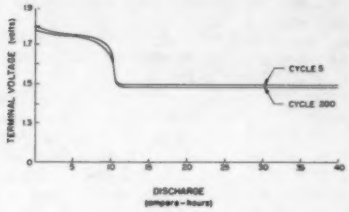
SECONDARY BATTERIES HAVING A ZINC NEGATIVE ELECTRODE

Allen Charkey, Brookfield, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Continuation of Ser. No. 165,458, Feb. 24, 1978, abandoned, which is a continuation of Ser. No. 759,127, Jan. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 606,866, Aug. 22, 1975, Pat. No. 4,022,953. This application May 7, 1981, Ser. No. 261,375

Int. Cl.³ H01M *4/00*

U.S. Cl. 429—27 **12 Claims**



1. A battery having a positive electrode including active material and a negative electrode including zinc material and cadmium particulate matter dispersed in said zinc material, said battery being constructed with such positive electrode active material and said zinc material in quantities such that said positive electrode active material is electrochemically depleted prior to electrochemical depletion of said zinc material in discharging of said battery, whereby said cadmium particulate matter is electrochemically inactive with respect to said positive electrode active material in such battery discharging, said negative electrode including: an electrically conductive support, a first layer overlying said conductive support and comprised of said cadmium particulate matter and a first binder therefor and a second layer overlying said first layer and comprised of said zinc material, said cadmium particulate matter and a second binder therefor.

4,415,637

CATHODE ELECTRODE STRUCTURES FOR SODIUM SULPHUR CELLS AND THEIR MANUFACTURE

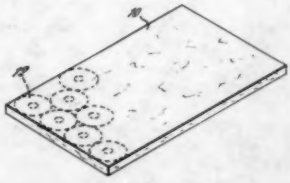
Graham Robinson, Tarvin; Raymond O. Ansell, Frodsham, and Michael McNamee, Wallasey, all of England, assignors to Chloride Silent Power Limited, London, England

Filed Mar. 15, 1982, Ser. No. 358,417

Claims priority, application United Kingdom, Mar. 18, 1981, 8108541

Int. Cl.³ H01M *4/58*

U.S. Cl. 429—218 **6 Claims**



1. A method of forming a cathode structure for a sodium sulphur cell comprising the steps of impregnating, with sulphur, a sheet of fibrous electronically-conductive material having fibres extending in random directions parallel to the plane of the sheet and punching from the sheet one or more

elements each element having an aperture extending through the sheet normal to the plane thereof.

6. A cathode structure for a sodium sulphur cell comprising a plurality of elements formed by the method of claim 1.

4,415,638

LEAD-ACID STORAGE BATTERY

Richard M. Meighan, Lansdale, and Harry R. Cash, Jr., Jeffersonville, both of Pa., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 214,735, Dec. 9, 1980, Pat. No. 4,359,508. This application Sep. 13, 1982, Ser. No. 417,041

Int. Cl.³ H01M *10/06*

U.S. Cl. 429—225 **3 Claims**

1. In a dry charged lead-acid storage battery comprising a container for an electrolyte and electrically-connected battery elements including freshly-formed positive and negative plates disposed therein, the improvement of negative plates having an initial on charge polarization which has been reduced to not greater than zero and of positive plates having an initial on charge polarization which has been maintained sufficiently high that complete anodization of bare metal thereof is forced to occur when the battery is activated, first placed in float service and charged to the extent that the on charge polarization of the positive plates becomes greater than zero.

4,415,639

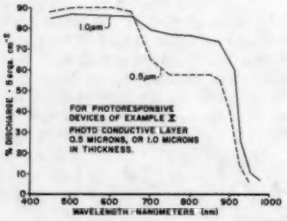
MULTILAYERED PHOTORESPONSIVE DEVICE FOR ELECTROPHOTOGRAPHY

Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 7, 1982, Ser. No. 414,997

Int. Cl.³ G03G *5/14*

U.S. Cl. 430—57 **30 Claims**


1.0μm
0.5μm
FOR PHOTORESPONSIVE DEVICES OF EXAMPLE X
PHOTO CONDUCTIVE LAYER 0.5 MICRONS, OR 1.0 MICRONS IN THICKNESS.
% DISCHARGE - 6 erg. cm⁻²
WAVELENGTH - NANOMETERS (nm)

1. An improved photoresponsive device comprised of a substrate, a hole blocking layer, an optional adhesive layer, an inorganic photogenerating layer, an organic photoconductive layer sensitive to infra-red radiation, and a top coating of a hole transport layer.

3. An improved photoresponsive device in accordance with claim 1 comprised in the order stated of the following layers: (1) a substrate, (2) metal oxide hole blocking layer, (3) an adhesive layer, (4) a photoconductive composition capable of enhancing or reducing the intrinsic properties of a photogenerating layer in the infra-red and/or visible region of the spectrum, which composition is selected from the group consisting of organic photoconductive compositions, charge transfer complex compositions, sensitizers, and mixtures thereof, (5) an inorganic photogenerating layer and, (6) a hole transport layer.

4,415,640

ELECTROPHOTOGRAPHIC ELEMENT WITH FLUORENYLIDENE HYDRAZONE COMPOUNDS

Satoshi Goto; Kiyoshi Sawada; Osamu Sasaki; Akira Kinoshita, all of Hino; Yoshiaki Takei, and Yoshihide Fujimaki, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

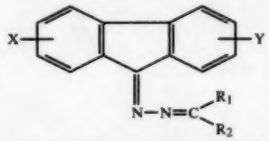
Filed Feb. 18, 1982, Ser. No. 350,039

Claims priority, application Japan, Feb. 19, 1981, 56/24078

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—59 **14 Claims**

1. An electrophotographic light-sensitive element comprising a conductive support having thereon a light-sensitive layer comprising at least one hydrazone compound having the following formula:



wherein R_1 is selected from the group consisting of an aryl group and a substituted aryl group; R_2 is selected from the group consisting of a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group; and X and Y are each selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, a substituted alkyl group, an alkoxy group, a substituted alkoxy group, an amino group, a substituted amino group, a nitro group and a cyano group.

4,415,641

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

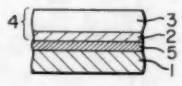
Satoshi Goto; Akira Kinoshita, both of Hino; Yoshiaki Takei, and Yoshihide Fujimaki, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,934

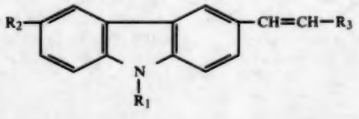
Claims priority, application Japan, Mar. 11, 1981, 56-35069

Int. Cl.³ G03C *1/16;* **C07D** *209/82*

U.S. Cl. 430—59 **14 Claims**



1. An electrophotographic light-sensitive element comprising a conductive support which supports a light-sensitive layer containing a carbazole derivative of the formula:



wherein R_1 is an aryl group, R_2 is hydrogen, a halogen, an alkyl, an alkoxy, an amino or hydroxy group, and R_3 is an aryl, or a heterocyclic group.

4,415,642

ELECTROPHOTOGRAPHIC MEMBER OF SE-TE-AS WITH HALOGEN

Kurt Elsässer; Helmut Ebner, and Armin Baumgärtner, all of Nuremberg, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 382,916

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123608

Int. Cl.³ G03G 5/082, 5/09

U.S. Cl. 430—86 1 Claim

1. An electrophotographic member comprising: a metal substrate; and a photosensitive layer deposited on said substrate, said layer including an alloy of selenium and tellurium, said layer being about 15 percent tellurium, said layer also including between about 20–40 ppm of arsenic and between about 20–30 ppm of a halogen.

4,415,643

PROCESS FOR PREPARING PHOTOCONDUCTIVE CADMIUM SULFIDE

Koji Goto, Kawasaki; Isamu Kajita, Kanagawa; Ichiro Nomura, and Hirokuni Kawashima, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,979

Claims priority, application Japan, Sep. 3, 1980, 55-122183; Sep. 10, 1980, 55-125509

Int. Cl.³ G03G 5/08

U.S. Cl. 430—94 7 Claims

1. A process for preparing photoconductive cadmium sulfide comprising steps of:

forming precipitated cadmium sulfide particles,

primarily firing said cadmium sulfide particles,

deionizing said cadmium sulfide particles, and

secondarily firing said cadmium sulfide particles.

4,415,644

ELECTROSTATIC IMAGE DEVELOPING TONER AND A METHOD FOR THE PRODUCTION THEREOF

Kiyoshi Tamaki; Hideki Murata; Sadatugu Terada; Tsuneo Wada, all of Hino; Akitoshi Matsubara, and Hiroyuki Takagiwa, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,067

Claims priority, application Japan, Aug. 26, 1980, 55-117918

Int. Cl.³ G03G 9/08; G08J 3/20

U.S. Cl. 430—106.6 25 Claims

1. An electrostatic image developing toner comprising a colorant, and polymer particles produced by suspension polymerization of a polymerizable monomer in the presence of an emulsification-preventing agent, said particles being from 1 to 50 microns.

4,415,645

DEVELOPER FOR ELECTROPHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Toshihiro Kouchi, Hirakata, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

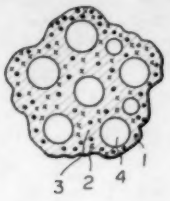
Filed Mar. 5, 1979, Ser. No. 17,804

Claims priority, application Japan, Mar. 10, 1978, 53/26518

Int. Cl.³ G03G 9/06

U.S. Cl. 430—107 8 Claims

1. A particulate composite developer for electrophotography which has a dispersion structure comprising a continuous phase consisting of a homogeneous mixture of a hard resin and a pigment and a plurality of dispersed phases consisting of spherical particles of a soft parting or fixing material having an emulsion grade size and being dispersed in the continuous phase, said resin being soluble in cold toluene, said soft parting or fixing material being selected from the group consisting of low-molecular-weight polyethylene and polypropylene and waxes, and being insoluble in cold toluene but soluble in hot toluene, said parting or fixing material (A) and said hard resin



(B) being present at an (A)/(B) weight ratio of from 95/5 to 55/45.

4,415,646

NITROGEN CONTAINING POLYMERS AS CHARGE ENHANCING ADDITIVE FOR ELECTROPHOTOGRAPHIC TONER

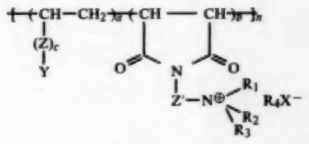
Robert J. Gruber, Pittsford; Steven B. Bolte, and Doretta Agostine, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1982, Ser. No. 354,472

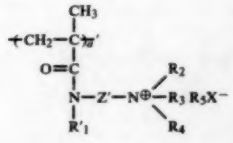
Int. Cl.³ G03G 9/00

U.S. Cl. 430—110 35 Claims

1. A positively charged toner composition comprised of resin particles, and pigment particles, and from about 0.1 to about 10 percent by weight of the toner composition, a polymeric charge enhancing additive selected from the group consisting of those additives of the following formulas:



and



wherein a and b are percentage numbers equaling 100, a being from about 20 weight percent to about 99 weight percent, and b being from about 80 weight percent to about 1 weight percent, n is a repeating number ranging from about 3 to about 300, Z is an oxygen atom, c is the number zero or 1, Y is an alkyl or aromatic radical, Z' is selected from the group consisting of aliphatic, aromatic, and heterocyclic radicals, R_1, R_2, R_3 and R_4 are independently selected from alkyl radicals containing from about 1 to about 22 carbon atoms, X is an anion, a' is a number of from about 50 to about 500, R_1' is hydrogen or an alkyl radical containing from 1 to about 22 carbon atoms.

4,415,647

POLYMERIC VEHICLE FOR DYE IMAGE-RECEIVING LAYER CONTAINING A POLY(VINYLIMIDAZOLE) MORDANT

Gerald W. Klein, Pittsford, and Wayne A. Bowman, Walworth, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,067
Int. Cl.³ G03C *1/40, 1/10, 5/54*
U.S. Cl. 430—213 **42 Claims**

1. In a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, said support also having thereon a dye image-receiving layer comprising a poly(vinylimidazole) mordant in a nonmordanting, water-permeable polymeric vehicle,

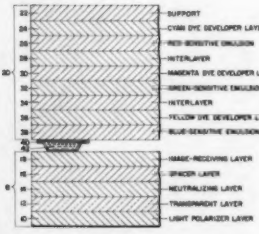
the improvement wherein said vehicle comprises recurring units derived from a hydroxyalkyl acrylate ester, and/or an N-hydroxyalkylacrylamide, and/or an N-alkylacrylamide.

4,415,648

VARIABLE DENSITY PHOTOGRAPHIC TRANSPARENCIES

Ruth C. Bilofsky, and Ronald A. Sahatjian, both of Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 17, 1981, Ser. No. 234,687
Int. Cl.³ G03B *27/76*
U.S. Cl. 430—220 **2 Claims**



1. A diffusion transfer photographic film unit designed for the provision of a transparency image, said diffusion transfer photographic film unit comprising

a photosensitive element including at least one photosensitized silver halide emulsion layer having an image-providing material associated therewith,

an image-receiving element adapted to be separated from said photosensitive element after transfer image formation,

and, a means for introducing an alkaline processing composition within said film unit;

said image-receiving element comprising a transparent sheet material supporting on one surface thereof an image-receiving layer, and including a light polarizer sheet forming an integral part of said image-receiving element; said light polarizer sheet being positioned adjacent the transparent support sheet of said image-receiving element.

4,415,649

FLEXOGRAPHIC PRINTING PLATES CONTAINING BLENDED ADHESIVES

Stanley H. Munger, Rumson; Michael R. Short, Freehold, and David W. Swatton, East Keansburg, all of N.J., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 237,861, Feb. 25, 1981, abandoned. This application Jun. 3, 1982, Ser. No. 384,558
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—271 **19 Claims**

1. A photosensitive flexographic element which consists essentially of

(A) a flexible support,

(B) a layer of a photosensitive, elastomeric composition which consists essentially of, based on the total weight of composition

(1) 55 to 90% by weight of a high molecular weight butadiene/acrylonitrile copolymer having a number average molecular weight of 20,000 to 75,000, an acrylonitrile content of 10 to 50% by weight and a carboxyl content of 0 to 15% by weight,

(2) 2 to 40% by weight of a nongaseous, ethylenically unsaturated compound containing at least one terminal ethylenic group, said compound being capable of forming a highr polymer by free-radical initiated, chain-propagating addition polymerization and being compatible with polymer (1);

(3) 0.001 to 10% by weight of an organic, radiation-sensitive, free-radical generating system, activatable by actinic radiation which initiates polymerization of the unsaturated compound; and, optionally

(4) thermal addition polymerization inhibitor,

(5) antioxidant,

(6) antiozonant,

(7) immiscible, polymeric or nonpolymeric organic or inorganic fillers or reinforcing agents which are essentially transparent at the wavelengths used for exposure, and

(8) compatible plasticizer;

(C) optionally a thin, hard flexible solvent soluble layer, and

(D) optionally a removable cover sheet; and between layers

(A) and (B) a layer of an adhesive composition which provides an adhesion value for the photosensitive layer (B) to the support (A) of at least 3 lbs/inch (53.57 kg/m) and consists essentially of a blend of at least two polymers taken from the group consisting of

(i) polyester resin which is a condensation polymer of ethylene glycol, terephthalic acid, isophthalic acid and azelaic acid in a molar ratio of about 6:2:1:3 the resin having a number average molecular weight of about 19,000 and a weight average molecular weight of about 37,000, 0 to 78% by weight based on the total weight of resin in the adhesive composition;

(ii) polyurethane resin which is a crystalline, thermoplastic resin having a Brookfield viscosity of 100–1200 using 5% by weight solids in methyl ethyl ketone and a Brookfield spindle #3 at 12 rpm, and an adhesive activation temperature in the range of 54° to 63° C., 0 to 78% by weight based on the total weight of resin in the adhesive composition,

(iii) polyamide which is a thermoplastic dimer acid polyamide resin having a Ball and Ring softening point of 132°–145° C., a viscosity at 210° C. of 40 to 60 poises, % elongation determined by ASTM D-1708 of 130 at −18° C., 560 at 24° C. and 100 at 60° C., tensile break determined by ASTM D-1708 of 4000 psi at −18° C., 450 psi at 24° C. and 170 psi at 60° C., 0 to 94% by weight based on the total weight of resin in the adhesive composition, and

(iv) polyamide which is a thermoplastic dimer acid polyamide resin having a Ball and Ring softening point of 150°–160° C., a viscosity at 210° C. of 28 to 38 poises, % elongation determined by ASTM D-1708 of 350 at

−18° C., 250 at 24° C. and 40 at 60° C., tensile break determined by ASTM D-1708 of 2200 psi at −18° C., 360 psi at 24° C. and 50 psi at 60° C., 0 to 97% by weight based on the total weight of resin in the adhesive composition with the proviso that when a blend of two polymers is present in the adhesive composition the percentage ranges are for the blend:
(i) 23% to 77% and (ii) 77% to 23%,
(i) 7% to 77% and (iii) 93% to 23%,
(i) 3% to 70% and (iv) 97% to 30%,
(ii) 7% to 72% and (iii) 93% to 28%,
(ii) 10% to 60% and (iv) 90% to 40%, and
(iii) 25 to 75% and (iv) 75% to 25%.

4,415,650
RECORDING MATERIAL

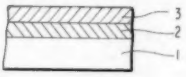
Keishiro Kido; Minoru Wada; Fumiaki Shinozaki, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1978, Ser. No. 915,689

Claims priority, application Japan, Jun. 14, 1977, 52-70848; Jun. 15, 1977, 52-70851

Int. Cl.[3] **G01D** *15/34;* **G03F** *7/00;* **G11B** *3/70, 7/00, 7/24*

U.S. Cl. 430—273 **24 Claims**



1. A thermal recording material comprising a support having in sequence thereon a recording layer thermally deformable through exposure to high intensity radiation and a layer of one or more metals, a layer of one or more inorganic compounds or a layer of a mixture of said one or more metals and said one or more inorganic compounds on said recording layer, the recording layer comprising a vacuum deposited layer of at least one organic compound selected from a group consisting of organic carboxylic acids, salts of organic carboxylic acids, esters of organic carboxylic acids, aromatic sulfonic acids, organic acylic sulfur compounds, nitrogen-containing heterocyclic compounds, sulfur-containing heterocyclic compounds, organic macromolecular compounds selected from the group consisting of polymethacrylic acid, polystyrene, polyamides, polyvinyl alcohol, polyethyleneoxide, methyl cellulose, polyvinyl butyral, polymethylmethacrylate, polyisobutylmethacrylate, polyethylene and rosin, dyes selected from the group consisting of azo dyes, anthraquinone dyes, indigoid dyes, soluble vat dyeing dyes, sulfur dyes, carbonium dyes, quinoneimine dyes, phthalocyanine dyes, cyanine dyes, quinoline dyes, nitro dyes and nitroso dyes and pigments selected from the group consisting of phthalocyanine pigments, anthraquinone pigments, and quinoline pigments, wherein said metal is magnesium, manganese, copper, zinc, aluminum, indium, tin or bismuth
and
said inorganic compound is a metal sulfide selected from the group consisting of CrS, CrS_2, Cr_2S_3, MoS_2, FeS, Fe_2S, CoS, NiS, Ni_2S, Cu_2S, Ag_2S, ZnS, In_2S_3, In_2S_2, GeS_x wherein x is a positive real number of 2.5 or less, SnS and SnS_2; a metal fluoride selected from the group consists of MgF_2, CaF_2 and RhF_3; a metal oxide selected from the group consisting of MoO_3, InO, In_2O, In_2O_3, and GeO; or a halide selected from the group consisting of AgI, AgBr, AgCl, PbI_2, $PbBr_2$, $PbCl_2$, PbF_2, SnI_2, $SnCl_2$, CuI, CuBr, CuCl, KI and KCl.

2. A thermal recording material consisting essentially of a support having thereon a recording layer thermally deformable through exposure to high intensity radiation, the recording layer comprising a vacuum deposited layer of at least one organic compound selected from the group consisting of organic carboxylic acids, salts of organic carboxylic acids, esters of organic carboxylic acids, aromatic sulfonic acids, organic acylic sulfur compounds, nitrogen-containing heterocyclic compounds, sulfur-containing heterocyclic compounds, organic macromolecular compounds selected from the group consisting of polymethacrylic acid, polystyrene, polyamides, polyvinyl alcohol, polyethyleneoxide, methyl cellulose, polyvinyl butyral, polymethylmethacrylate, polyisobutylmethacrylate, polyethylene and rosin, dyes selected from the group consisting of azo dyes, anthraquinone dyes, indigoid dyes, soluble vat dyeing dyes, sulfur dyes, carbonium dyes, quinoneimine dyes, phthalocyanine dyes, cyanine dyes, quinoline dyes, nitro dyes and nitroso dyes and pigments selected from the group consisting of phthalocyanine pigments, anthraquinone pigment and quinoline pigments, wherein said vacuum deposited layer of said at least one organic compound comprises a vacuum codeposited layer of a mixture of (a) said at least one organic compound and (b) at least one inorganic material selected from the group consisting of one or more metals, one or more inorganic compounds, and mixtures thereof.

4,415,651
AQUEOUS PROCESSABLE, POSITIVE-WORKING PHOTOPOLYMER COMPOSITIONS

Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 271,411, Mar. 30, 1981, abandoned. This application Jan. 4, 1982, Ser. No. 335,051

Int. Cl.[3] **G03C** *1/68*

U.S. Cl. 430—277 **27 Claims**

1. A positive-working, monomer-free photosensitive composition comprising the following components:
(i) about 10 to 90 percent by total weight of components (i), (ii), and (iii), of a polyene having a number average molecular weight of about 1,000 to 1,000,000, said polyene containing about 20 to 1800 milliequivalents of reactive unsaturated carbon to carbon groups per 100 g of polyene;
(ii) about 1 to 70 percent by total weight of components (i), (ii), and (iii), of a reactive mercapto acid; and
(iii) about 0.001 to 50 percent by total weight of components (i), (ii), and (iii) of a radiation-sensitive, radical-generating system, activatable by actinic radiation to initiate addition of the mercapto acid to the polyene.

4,415,652
AQUEOUS PROCESSABLE, POSITIVE-WORKING PHOTOPOLYMER COMPOSITIONS

Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 335,051, Jan. 4, 1982, which is a continuation-in-part of Ser. No. 271,411, Mar. 30, 1981, abandoned. This application Jul. 27, 1982, Ser. No. 400,660

Int. Cl.[3] **G03C** *1/68*

U.S. Cl. 430—277 **26 Claims**

1. A photosensitive composition comprising the following components:
(i) about 10 to 90 percent by total weight of components (i), (ii), and (iii), of a polyene having a number average molecular weight of about 1,000 to 25,000, said polyene containing (a) about 20 to 1000 milliequivalents of reactive unsaturated carbon to carbon groups per 100 g of polyene, and (b) about 10 to 50 mole percent of N-alkenylmaleimide units in which the alkenyl group contains about 3 to 18 carbon atoms;
(ii) about 5 to 50 percent by total weight of components (i), (ii), and (iii), of a reactive mercapto acid; and
(iii) about 0.1 to 50 percent by total weight of components (i), (ii), and (iii) of a radiation-sensitive, radical-generating system, activatable by actinic radiation to initiate addition of the mercapto acid to the polyene.

4,415,653

METHOD OF MAKING SENSITIVE POSITIVE ELECTRON BEAM RESISTS

Juey H. Lai, Burnsville; Richard Douglas, Crystal, both of Minn., and Lloyd Shepherd, Eau Claire, Wis., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 261,427, May 7, 1981, abandoned. This application Dec. 7, 1982, Ser. No. 447,579

Int. Cl.³ G03C 5/00

U.S. Cl. 430—296 12 Claims

1. A method of producing a sensitive positive resist image comprising the steps of

coating a substrate with a solution of a radiation sensitive copolymer comprising methacrylic acid and methacrylonitrile to form a thin polymeric film of said copolymer thereon;

prebaking the coated substrate at a temperature below the decomposition temperature of said copolymer;

exposing said polymeric film to ionizing radiation in a predetermined pattern to increase the solubility of the exposed areas thereof; and

developing said polymeric film to remove said copolymer from said exposed areas.

4,415,654

POST-EXPOSURE PROCESS

Rudolph L. Pohl, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 19, 1982, Ser. No. 409,699

Int. Cl.³ G03C 5/14

U.S. Cl. 430—328 3 Claims

1. In the process of post-exposing to actinic radiation a relief printing plate prepared from a photosensitive polymeric composition, the improvement which comprises said relief printing plate being immersed during said post-exposing in a dilute aqueous solution of a persulfate salt and a sufficient amount of a water-soluble carboxylic acid to produce a pH of about 1.5 to about 2.5.

4,415,655

ELECTROPHORETIC SEPARATION OF ISOENZYMES UTILIZING A STABLE POLYACRYLAMIDE SYSTEM

Aurora F. de Castro, Union, Mich., and Surendra K. Gupta, Elkhart, Ind., assignors to TechAmerica Group, Inc., Elwood, Kans.

Filed May 17, 1982, Ser. No. 379,115

Int. Cl.³ C12Q 1/50, 1/32; C12N 9/04, 9/12

U.S. Cl. 435—17 7 Claims

1. A method for separating isoenzymes which comprises the steps of applying an isoenzyme-containing sample to a support medium of polyacryl-amide gel containing acrylamide monomers in a buffer solution of a salt of 2-amino-2-methyl-1,3-propanediol at a pH of about 6.4 to 7.3 and an electrolyte buffer of 2-amino-2-methyl-1,3-propanediol taurine at a pH of about 8.0 to 10.0, subjecting the mixture to a differential electrical potential to produce migration of the isoenzymes and buffer ions and determining the presence of separated isoenzymes.

4,415,656

INCREASING THE STABILITY OF AMYLOGLUCOSIDASE

Ronald P. Rohrbach, Forest Lake, and Mary J. Maliarik, Lake Forest, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 21, 1982, Ser. No. 380,797

Int. Cl.³ C12P 19/20; C12N 9/34

U.S. Cl. 435—96 4 Claims

1. A method of increasing the productivity in amyloglucosidase-catalyzed hydrolysis of a 1,4-linked carbohydrate comprising contacting a solution of said carbohydrate with amyloglucosidase at a pressure greater than about 500 psig.

4,415,657

PROCESS FOR PREPARATION OF AN OPTICALLY ACTIVE MONOALKYL ESTER OF β-(S)-AMINOGLUTARIC ACID

Hamao Umezawa, Tokyo; Masaji Ohno, Kamakura; Junzo Hasegawa; Shigeki Hamaguchi, both of Akashi; Masahiro Ogura, Ono; Hajime Kawaharada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Chemical Industry Company, Limited, Osaka, Japan

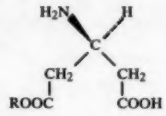
Filed Dec. 8, 1981, Ser. No. 328,696

Claims priority, application Japan, Dec. 30, 1980, 55-186819; Feb. 6, 1981, 56-17214

Int. Cl.³ C12P 13/04, 7/62; C07B 19/02

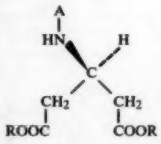
U.S. Cl. 435—106 15 Claims

1. A process for preparation of an optically active monoalkyl ester of β-(S)-aminoglutaric acid represented by the formula (I):



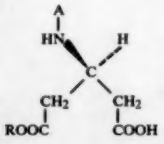
(I)

wherein R represents an alkyl having 1~4 carbon atoms, which comprises subjecting a dialkyl ester of β-protected aminoglutaric acid represented by the formula (II):



(II)

wherein R represents the same as difined above and A represents an amino-protecting group removable by catalytic hydrogenolysis or mild hydrolysis, to the action of a culture broth, cells, or treated cells of a microorganism which is capable of stereoselectively hydrolyzing only one of the ester groups in said dialkyl ester of β-protected aminoglutaric acid (II) and which belongs to the genus Candida, Pichia, Trichosporon, Geotrichum, Aspergillus, Absidia, Actinomucor, Hilicostylum, Mucor, Mortierella, Paecilomyces, Zygorhynchus, Fusarium, Cricinella, Cunninghamella, Rhizopus, Penicillium, Proteus, Nocardia, Micrococcus, Hafnia, Brevibacterium, Torulopsis, Debaryomyces, Endomyces, Saccharomycopsis, Cryptococcus, Pachysolen, Sporobolomyces, Syringospora, Corynebacterium, Pseudomonas, Arthrobacter, Bacillus, Staphylococcus, or Streptococcus, to produce an optically active monoalkyl ester of β-protected (S)-aminoglutaric acid represented by the formula (III):



(III)

wherein R and A each represents the same as defined above, and then removing the amino-protecting group from the product (III).

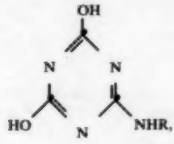
4,415,658

PROCESS FOR DECOMPOSING 2,4-DIHYDROXY-6-AMINO-S-TRIAZINE DERIVATIVES

Alasdair M. Cook, Wädenswil, and Ralf Hütter, Gockhausen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 1, 1981, Ser. No. 298,440
Claims priority, application Switzerland, Sep. 10, 1980, 6796/80
Int. Cl.³ C12N *1/20;* C12P *1/04, 17/12, 13/00;* C12R *1/38*
U.S. Cl. 435—122 23 Claims

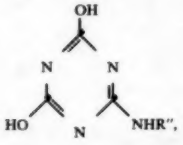
1. A process for decomposing 2,4-dihydroxy-6-amino-s-triazine derivatives of the formula I



(I)

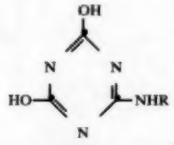
wherein R is an aliphatic or cycloaliphatic radical having 1 to 6 carbon atoms, in effluents containing said compounds, which process comprises bringing the effluents, under aerobic conditions, into contact with either of the strains Pseudomonas sp. NRRL B-12228 or Pseudomonas sp. NRRL B-12229 at temperatures of from 20° to 41° C.

9. A process for conversion of 2-hydroxy-4,6-diamino-s-triazine derivatives of formula II



(Ib)

wherein R is an aliphatic or cycloaliphatic radical having 1 to 6 carbon atoms, contained in effluents, into a 2,4-dihydroxy-6-amino-2-triazine of the formula I,



(I)

which process comprises bringing the effluents, under aerobic conditions, into contact with Pseudomonas ps. NRRL B-12227 at temperatures of from 20° to 41° C.

4,415,659

METHOD FOR MASHING STARCH-RICH MATERIAL FOR ALCOHOL PRODUCTION

Pentti P. Ronkainen, Espoo; Olavi A. Leppänen; Kai J. Harju, both of Helsinki, and Pertti J. Eriipolku, Rajamäki, all of Finland, assignors to Oy Alko AB, Helsinki, Finland

Filed Jan. 22, 1982, Ser. No. 341,933
Claims priority, application Finland, Feb. 5, 1981, 810344
Int. Cl.³ C12P *1/00, 7/06;* C12C *7/04*
U.S. Cl. 435—161 2 Claims

1. Method for mashing raw starch-rich material used in alcohol manufacture which comprises introducing whole or partially crushed raw starch-rich material into a reactor, reducing the pressure in the reactor to about 0.01 MPa, introducing heated water into the reactor followed by steam at about 0.7 MPa pressure and steaming the material in the reactor at about 0.7 MPa pressure for about 5 minutes, the water to starch-rich material ratio being maintained during the whole mashing time below 2:1, withdrawing steam from the reactor until the temperature in said reactor has fallen to 90°–100° C., introducing pressurized air into said reactor until the pressure therein has risen to about 1.5 MPa, and explosively ejecting the starch material from said reactor whereby soft grains therein are broken down.

4,415,660

METHOD OF MAKING A CLONING VECTOR

Richard N. Goldstein, Cambridge, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Division of Ser. No. 881,170, Feb. 27, 1978, Pat. No. 4,332,901.
This application Mar. 12, 1982, Ser. No. 357,414
Int. Cl.³ C12N *15/00*
U.S. Cl. 435—172 5 Claims

1. A method of making a cloning vector which comprises mutagenizing bacteriophage P4 wt or P4 vir_1, then isolating the mutant having plaque forming units appearing, in a cesium chloride equilibrium density gradient at 24° C., in the density range from 1.42 to 1.35 g/ml and displaying a density profile of plaque forming units having three peaks at about 1.42, 1.39 and 1.35 g/ml respectively.

4,415,661

MICROBIAL DEGRADATION OF PETROLEUM MATERIALS

Mandayam J. Thirumalachar, and Mandayam J. Narasimhan, Jr., both of P.O. Box 506, Locust St., Walnut Creek, Calif. 94596

Filed Jul. 30, 1981, Ser. No. 288,616
Int. Cl.³ C12N *11/00, 1/26, 1/14;* C10G *32/00*
U.S. Cl. 435—174 33 Claims

30. A biologically pure culture of the fungus *Geotrichum marinum* Thirumalachar sp nov., ATCC 20614, said culture being capable of effecting degradation of crude petroleum and petroleum products.

4,415,662

MICROBIAL DEGRADATION OF PETROLEUM MATERIALS

Mandayam J. Thirumalachar, and Mandayam J. Narasimhan, Jr., both of P.O. Box 506, Locust St., Walnut Creek, Calif. 94596

Filed Jul. 30, 1981, Ser. No. 288,615
Int. Cl.³ C12N *11/14, 1/26, 1/14;* C10G *32/00*
U.S. Cl. 435—176 60 Claims

58. A biologically pure culture of the fungus *Actinomucor elegans* (Ediam) Benj. & Hasselt, Strain No. TC-405, ATCC 20613, said culture being capable of effecting degradation of crude petroleum and petroleum products in an environment.

4,415,663

SUPPORT MATRIX FOR IMMOBILIZED ENZYMES

Ted Symon, Lombard, and Chester F. Barszcz, Chicago, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1982, Ser. No. 411,157
Int. Cl.³ C12N *11/14, 11/08;* B01J *31/02;* B32B *17/10*
U.S. Cl. 435—176 15 Claims

1. A support matrix comprising a porous support selected from the group consisting of alumina, silica, thoria, magnesia, porous glass, ceramics, and combinations thereof, impregnated with a polyamine selected from the group consisting of poly(ethyleneamines) and epiamines, substantially all of whose nitrogens bear a pendant epoxide group, wherein said epiamines are the reaction products of polyepichlorohydrin with an alkylenediamine containing from 2 to about 10 carbon atoms.

14. An immobilized enzyme system comprising the support matrix of claim 1 having an enzyme covalently bonded thereto.

4,415,664

EPIAMINE-BASED SUPPORT MATRIX

Chester F. Barszcz, Chicago, and Ted Symon, Lombard, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1982, Ser. No. 411,158
Int. Cl.³ C12N 11/14, 11/08; B01J 31/02; B32B 17/10
U.S. Cl. 435—176 12 Claims

1. A support matrix comprising a porous inorganic support selected from the group consisting of alumina, silica, thoria, magnesia, porous glass, ceramics, and combinations thereof, impregnated with an epiamine cross-linked with an excess of a dialdehyde selected from the group of dialdehydes with the formula $OHC(CH_2)_pCHO$, where p is an integer from 2 to about 10, and "phthalaldehyde, wherein the epiamine is the reaction product of poly(epichlorohydrin) with an alkylenediamine containing from 2 to about 10 carbon atoms."

11. An immobilized enzyme system comprising the support matrix of claim 1 having an enzyme covalently bonded thereto.

4,415,665

METHOD OF COVALENTLY BINDING BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES TO POLYMERIC SUBSTANCES

Klaus H. Mosbach, Furulund, and Kurt G. I. Nilsson, Lund, both of Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Dec. 1, 1981, Ser. No. 326,332
Claims priority, application Sweden, Dec. 12, 1980, 8008776
Int. Cl.³ C12N 11/12, 11/10, 11/08
U.S. Cl. 435—179 13 Claims

1. A method of covalently binding

(a) a biologically active organic substance that contains at least one substituent selected from the group consisting of primary and secondary amino groups,
thiol groups, and
aromatic hydroxy groups directly to a

(b) polymeric substance (PM) containing at least one hydroxy group, comprising the steps of:

(1) first forming a reactive derivative PM-O-SO_2-R by reacting

(i) an organic sulfonyl halogenide of the formula Hal-SO_2-R, with

(ii) a polymeric substance (PM) containing at least one hydroxy group,
wherein R is an organic group and Hal is halogen, and
wherein said at least one reacting hydroxy group is bonded to carbon atoms in the polymeric substance (PM), and then

(2) reacting said reactive derivative PM-O-SO_2-R directly with the biologically organic substance as set forth in (a).

4,415,666

ENZYME ELECTRODE MEMBRANE

Paul A. D'Orazio, Mishawaka, Ind.; Arthur R. Eddy, Jr., Depew, N.Y.; Eric J. Fogt, Maple Grove, Minn.; James E. Jones, Elkhart, and Bruce J. Oberhardt, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 5, 1981, Ser. No. 318,626
Int. Cl.³ C12N 11/12, 11/04; C12M 1/40; G01N 27/26
U.S. Cl. 435—179 14 Claims

1. A method of making a 40 to 100 micron contiguous multilayer membrane suitable for use with an electrochemical sensor in the measurement of an unknown which comprises:

providing a first polymer dissolved in an inert organic solvent and casting said polymer in solution onto an inert support surface which is unreactive with said polymer and does not form a bond to said polymer,

permitting said solution to form a 1 to 10 micron dense relatively nonporous film and thereby obtain a first layer,

providing a second polymer dissolved in an inert organic solvent, mixing said second polymer dissolved in solvent with a nonsolvent for said polymer and with glucose oxidase to obtain a dispersion and thereafter casting said dispersion onto said first layer, and thereafter permitting said second polymer to dry to form a second 40 to 80 micron highly porous layer less dense than the first layer,

thereby forming said contiguous multilayer membrane, said layers of the membrane being fused together such that no clear distinction can be made between the layers at the boundary and the boundary between the layers is a diffusion zone.

4,415,667

CARBOXYPEPTIDASE A GAMMA AND PROCESS FOR PREPARING SAME

Atsushi Koide, Funabashi, and Masayuki Yoshizawa, Kawagoe, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,810
Claims priority, application Japan, Mar. 12, 1981, 56-34523
Int. Cl.³ C12N 9/48, 9/64
U.S. Cl. 435—212 4 Claims

1. A carboxypeptidase Aγ substance in which the NH_2-terminal sequence containing 25 amino acid residues is as follows:

Asn-Tyr-Ala-Thr-Tyr-His-Thr-Leu-Glu-Glu-Ile-
Tyr-Asp-Phe-Met-Asp-Ile-Leu-Val-Ala-Glu-His-
Pro-Gln-Leu-,

said substance having the following properties:

(a) physical state=needle crystals

(b) molecular weight, according to gel permeation method=38,900

(c) constituent amino acids=

TABLE 1

Amino acid	Number
Lysine	15
Histidine	10
Arginine	12
Aspartic acid and asparagine	36
Threonine	27
Serine	28
Glutamic acid and glutamine	32
Proline	16
Glycine	28
Alanine	24
Cystine	2
Valine	15
Methionine	4
Isoleucine	27
Leucine	25
Tyrosine	18
Phenylalanine	19
Tryptophan	9
Total	347

(d) metal contained=one Zn atom per molecule

(e) coefficient of sedimentation $S_{20,w}=3.3$

(f) isoelectric point, at an ionic strength of 0.3=4.3

(g) specific substrates=Nα-carbobenzoxyglycyl-L-phenylalanine and casein

(h) Michaelis constant (Nα-carbobenzoxyglycyl-L-phenylalanine as the substrate)=20 mM

(i) pH of optimum activity=7 to 8.

4,415,668

CELL CULTURE

Don L. Siegel, Brookline, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Apr. 20, 1981, Ser. No. 255,480
Int. Cl.³ C12N 5/02, 11/08; C12M 3/02
U.S. Cl. 435—241 6 Claims

1. The method of growing anchorage-dependent cells in microcarrier cell culture and preparation for examination in a non-aqueous organic solvent environment comprising growing cells in aqueous environment on microcarriers comprising polymeric support material having reactive chemical moieties

thereon selected from the group consisting of hydroxyl and amide moieties and having bonded thereto hydrophobic chemical moieties selected from the group consisting of hydroxyethyl, hydroxypropyl and hydroxyalkoxypropyl moieties and bonded thereto an amount of positively charged chemical moieties to provide an exchange capacity within the range of between about 0.1 and about 4.5 meq/gram of dry untreated polymeric support material,

staining and transferring said microcarriers bearing said cells from said aqueous cell growth environment to a non-aqueous organic solvent environment without shrinkage of said microcarriers, and

examining the unshrunk microcarriers bearing said cells previously subjected to staining.

4,415,669

SUBSTANCE AND PROCESS FOR ITS PRODUCTION

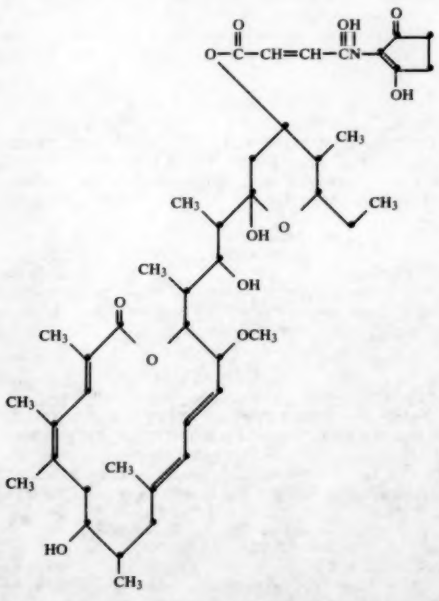
Sebastian Hernandez, Madrid, Spain, assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 7, 1981, Ser. No. 327,837

Int. Cl.³ C12N *1/20*; C12R *1/55*; C12P *19/62, 17/08*

U.S. Cl. 435—253 **1 Claim**

1. A biologically pure culture of the microorganism *Streptomyces hygroscopicus* MA-5285, ATCC-31955 and capable of producing a compound having the formula



in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts.

4,415,670

MOTIONLESS MIXER AS CELL CULTURE PROPAGATOR

Roy Grabner, Blue Bell, Pa., and Edward L. Paul, Chatham Township, Union County, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 166,641, Jul. 7, 1980, Pat. No. 4,296,204, which is a continuation-in-part of Ser. No. 872,289, Jan. 25, 1978, abandoned. This application Jun. 22, 1981, Ser. No. 276,418

Int. Cl.³ C12M *3/00*

U.S. Cl. 435—285 **2 Claims**

1. A motionless mixer element for propagating tissue culture cells, said mixer element being disposed within a housing and comprising an assembly of parallel sheets shaped to provide a plurality of channels which converge and diverge to form a plurality of mixing cells, each cell being formed and bounded by the juncture of two inlet channels which converge toward each other at about right angles in one plane, and two outlet channels which diverge from each other at about right angles in another plane, the planes being rotated about 90° with respect to each other, the cells being adapted to receive a fluid entering a cell in two separate inlet streams and to rearrange the fluid due to shearing and extensional forces and to direct the fluid exiting the cell into two outlet streams each of which leaves the cell in a direction different from either inlet stream, and tissue culture cells attached to the assembly of parallel sheets.

4,415,671

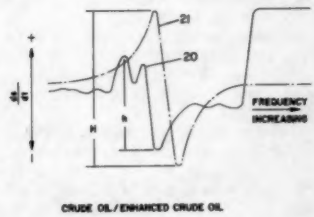
METHOD FOR MODIFYING ELECTRON SPIN RESONANCE SIGNALS FROM HYDROCARBON CRUDE

Stephen W. Nicksic, Brea, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 30, 1980, Ser. No. 202,102

Int. Cl.³ G01N *24/10*

U.S. Cl. 436—29 **8 Claims**



1. A method for enhancing electron spin resonance signals from crude petroleum comprising contacting said samples with a halogen or ferric chloride to affect the number of the population of free radical asphaltenes in said crude petroleum while detecting said electron spin resonance signals.

4,415,672

GLASS-CERAMIC COMPOSITIONS OF HIGH REFRACTORINESS

John J. Brennan, Portland, Conn.; Kenneth Chyung, and Mark P. Taylor, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 20, 1982, Ser. No. 380,464

Int. Cl.³ C03C *3/22*

U.S. Cl. 501—4 **4 Claims**

1. An opaque glass-ceramic body exhibiting high strength and use temperature up to 1200° C., wherein beta-spodumene and/or beta-quartz solid solution constitutes the predominant crystal phase, which body is essentially free from TiO_2 and consists essentially, expressed in terms of weight percent on the oxide basis, of:

Li_2O	1.5–5
Al_2O_3	15–25
SiO_2	60–75
ZrO_2	1–3
Nb_2O_5	0–10
Ta_2O_5	0–10
$Nb_2O_5 + Ta_2O_5$	1–10
MgO	0–10
ZnO	0–3
BaO	0–3
Fe_2O_3	0–3
Nd_2O_3	0–3
Na_2O	0–3
K_2O	0–3
CaO	0–3
SrO	0–3
$ZnO + BaO + Fe_2O_3 + Nd_2O_3 + Na_2O + K_2O + CaO + SrO$	0–10

4,415,673

REFRACTORY MATERIAL

Roy C. Feagin, Boca Raton, Fla., assignor to Remet Corporation, Chadwicks, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,315
Int. Cl.³ C04B *35/48*
U.S. Cl. 501—102 **10 Claims**

1. A method of making a refractory shape comprising mixing an acid stabilized, aqueous, colloidal zirconia sol with a refractory material, said refractory material comprising an active refractory material capable of gelling said sol and being present in an amount sufficient to gel said sol after a suitable non-gel working period, shaping the mix before gelation, allowing the mix to gel and drying the shaped mix.

4,415,674

ELECTRICAL INSULATING REFRACTORY COMPOSITION

Walter R. Johnson, Chuckey, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 12, 1982, Ser. No. 367,198
Int. Cl.³ C04B *35/04, 35/48*
U.S. Cl. 501—104 **4 Claims**

1. A MgO heat conductive electrical insulating embedding composition for sheathing electrical heating elements comprising:

a. from 92.0 to 99.99 weight % MgO; and

b. from 0.01 to 8.0 weight % spherically formed zirconia.

4,415,675

SYNGAS CONVERSION PROCESS

Wen-Ghih Tsang, Framingham, Mass., and Lynn H. Slaugh, Cypress, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1982, Ser. No. 410,232
Int. Cl.³ C07C *27/06*
U.S. Cl. 518—715 **2 Claims**

1. A process for converting a mixture of hydrogen and carbon monoxide to a hydrocarbon product which comprises at least 20 percent oxygenated hydrocarbons which process comprises contacting the hydrogen and carbon monoxide at a temperature ranging from about 175° C. to about 350° C. and a pressure ranging from about 5 bar to about 500 bar with a catalyst composition prepared by a process which comprises:

a. ion-exchanging the sodium ions of the sodium form of a faujasite type zeolite with ruthenium ions by contacting said zeolite with a solution containing a soluble ruthenium compound,

b. calcining the ruthenium exchanged zeolite in nitrogen at a temperature ranging from about 300° C. to about 600° C.,

c. contacting the ruthenium-containing zeolite with hydrogen at a temperature ranging from about 300° C. to about 600° C. whereby the ruthenium is reduced to the metal,

d. contacting the ruthenium metal-containing zeolite with a solution of borane,

e. calcining the borane-treated zeolite in nitrogen at a temperature ranging from about 300° C. to about 600° C. and then

f. contacting the borane-treated zeolite with hydrogen at a temperature ranging from about 300° C. to about 600° C.

4,415,676

SYNGAS CONVERSION PROCESS

Wen-Ghih Tsang, Framingham, Mass., and Lynn H. Slaugh, Cypress, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1982, Ser. No. 410,297
Int. Cl.³ C07C *1/04*
U.S. Cl. 518—715 **3 Claims**

1. A process for converting a mixture of hydrogen and carbon monoxide to a hydrocarbon product which comprises 70 or more weight percent of paraffins having carbon numbers between about 25 and about 35 which process comprises contacting the hydrogen and carbon monoxide at a temperature ranging from about 175° C. to about 350° C. and a pressure ranging from about 5 bar to about 500 bar with a catalyst composition prepared by a process which comprises:

a. ion-exchanging the sodium ions of the sodium form of a faujasite type zeolite with ruthenium ions by contacting said zeolite with a solution containing a soluble ruthenium comound,

b. calcining the ruthenium exchanged zeolite in nitrogen at a temperature ranging from about 300° C. to about 600° C.,

c. contacting the ruthenium-containing zeolite with hydrogen at a temperature ranging from about 300° C. to about 600° C. whereby the ruthenium is reduced to the metal,

d. contacting the ruthenium metal-containing zeolite with a solution of borane,

e. calcining the borane-treated zeolite in air at a temperature ranging from about 300° C. to about 600° C. and then

f. contacting the borane-treated zeolite with hydrogen at a temperature ranging from about 300° C. to about 600° C.

4,415,677

REMOVAL OF SULFATE IONS FROM BRINE USING COMPOSITE OF POLYMERIC ZIRCONIUM HYDROUS OXIDE IN MACROPOROUS MATRIX

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1981, Ser. No. 307,828
Int. Cl.³ B01J *39/18*
U.S. Cl. 521—28 **11 Claims**

1. Macroporous cation exchange resin beads having sulfonic acid functional groups and having post-deposited therein polymeric zirconium hydrous oxide.

4,415,678

REMOVAL OF SULFATE IONS FROM BRINE USING AMORPHOUS POLYMERIC ZIRCONIUM OXIDE FORMED WITHIN A MACROPOROUS POLYMER MATRIX

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1981, Ser. No. 307,830
Int. Cl.³ B01J *39/18*
U.S. Cl. 521—28 **10 Claims**

1. A macroporous cation exchange resin composite having attached thereto in the resin phase sulfonic acid functional groups, said functional groups being ionically combined by post reaction with amorphous polymeric hydrous zirconium oxide, there being substantially little or no uncombined amor-

phous polymeric hydrous zirconium oxide in the void or pore phase of the resin.

4,415,679

PROCESS FOR ESTERIFYING FLUORINATED CARBOXYLIC ACID POLYMER

Walther G. Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Oct. 26, 1981, Ser. No. 314,973

Int. Cl.[3] **B01J** *47/12, 39/20;* **C08F** *8/14*

U.S. Cl. 521—31 **14 Claims**

1. A process for preparing a second fluorinated polymer having —COOR functional groups where R is C_1 to C_8 alkyl from a first fluorinated polymer having —COOH functional groups, which process comprises contacting said first polymer with a compound selected from the group consisting of

$$B(OR)_3,\ O{=}S(OR)_2,\ T_nC(OR)_{4-n} \text{ and } ROCH\text{—}\underset{\llcorner(CH_2)_p\lrcorner}{O}\text{—}CHOR$$

where n is 0, 1 or 2, T is H or C_1 to C_8 alkyl and two T's taken together can be $-(CH_2)_p-$ where p is 4 or 5, and q is 2 or 3, at a temperature between 20° C. and the decomposition temperature of said compound, and separating said second polymer from the product of said contacting.

4,415,680

WATER-IMPERMEABLE POLYOLEFIN FOAM AND PROCESS FOR PREPARING THE SAME

Masahiro Ushirokawa, Settsu; Takeshi Iwahama, Yao, and Kenichi Senda, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 217,983, Dec. 18, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,142

Int. Cl.[3] **C08J** *9/24*

U.S. Cl. 521—56 **7 Claims**

1. A substantially water-impermeable polyolefin molded foam of expanded polyolefin beads, said molded foam being prepared by the steps of filling a mold with expandable beads, heating the expandable beads to melt-adhere the surface of the beads to each other and to expand the beads, allowing the resultant heated beads to stand in the state that the polyolefin resin maintains its flowability whereby voids between the beads are decreased so that the resultant molded foam will have a water-impermeability measured by the volume of leakage of pressurized air of 0.020 kg/cm^2 through the thickness of the foam of not more than 10 ml/100 cm^{2}min, cooling the heated beads and removing the resultant molded foam from the mold.

4,415,681

STABILIZED CROSSLINKED DISPERSION

Stanley K. Horvath, Rochester, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 199,899, Oct. 23, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 292,853

Int. Cl.[3] **C08F** *265/06, 2/14;* **C08G** *12/32;* **C08L** *61/28*

U.S. Cl. 523—334 **18 Claims**

1. A stable crosslinked dispersion containing microgel particles, said dispersion being:

(i) formed by addition polymerization of

(a) between about 1 and about 10 mole percent each of first and second ethylenically unsaturated monomers, each bearing functionality capable of crosslinking reaction with the other, and

(b) between about 80 and about 98 mole percent of at least one monoethylenically unsaturated monomer

in the presence of (I) a hydrocarbon dispersing liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer comprising the reaction product of ethylenically unsaturated monomers (A) and copolymer reactant (B), said ethylenically unsaturated monomers (A) bearing functionality capable of condensation reaction with complementary functionality of said copolymer reactant (B) which comprises a random copolymer of

(x) between about 20 and about 45 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially insoluble in said organic liquid;

(y) between 40 and about 75 weight percent of ethylenically unsaturated monomers, homopolymers f which would be substantially soluble in said organic liquid; and

(z) between about 5 and about 15 weight percent of ethylenically unsaturated monomers bearing said complementary functionality capable of condensation reaction with said ethylenically unsaturated monomers (A), said ethylenically unsaturated monomers (A) being reacted with said copolymer reactant (B) in an amount sufficient to react with at least about 10 percent of said complementary functionality on said copolymer reactant (B), wherein said addition polymerization is carried out at elevated temperature such that the dispersion polymer is first formed and then crosslinked; and

(ii) stabilized further by inclusion therein of a further stabilizer which, except for solvent, consists essentially of butylated melamine formaldehyde resin having a number average molecular weight in the range of about 700 to about 2,500, said further stabilizer being included in said crosslinked dispersion in an amount ranging from about 15 to about 75 parts of resin solids per 100 parts total resin solids in said crosslinked dispersion.

4,415,682

STABLE AQUEOUS EPOXIDE RESIN DISPERSION, A PROCESS FOR ITS PREPARATION, AND ITS USE

Wilhelm Becker, Hamburg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,028

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1981, 3147458

Int. Cl.[3] **C08G** *59/02, 59/18, 59/20*

U.S. Cl. 523—403 **19 Claims**

1. A low-solvent, stable, aqueous dispersion containing as essential ingredients

(a) 35 to 65% by weight of an epoxide resin having a mean epoxide equivalent weight in the range from 250 to 5,000,

(b) 2 to 20% by weight of a non-ionic dispersant comprising condensation products of

(b_1) polyalkylene glycols having molecular weights of 200 to 20,000 with

(b_2) polyglycidyl ethers of polyhydric phenols having an

epoxide equivalent weight of 100 to 2,000 in an equivalent ratio of OH to epoxide groups of 1:(0.85 to 1.5),

(c) 0.2 to 20% by weight of organic solvent having a boiling point below 160° C. and

(d) 35 to 60% by weight of water,

the proportions always totalling 100% by weight, the particle size being on average less than 1 μm and the total solids content of the dispersion being 10 to 80% by weight.

4,415,683

HYDROXYETHYL HYDROXYPROPYL CELLULOSE ETHER THICKENERS FOR AQUEOUS COATING COMPOSITIONS

John M. Kernstock, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 26, 1982, Ser. No. 362,228

Int. Cl.³ C08L *1/26, 1/28*

U.S. Cl. 524—43 **10 Claims**

1. An aqueous coating composition comprising (a) an aqueous dispersion of finely divided, water-insoluble polymer particles, (b) a pigment and (c) a hydroxyethyl hydroxypropyl cellulose ether having a thermal haze point of at least about 70° C., a gel point below 100° C., a total molar substitution of about 2.5 to 4.0 and a ratio of hydroxypropyl molar substitution to hydroxyethyl molar substitution of about 1:2 to 2:1 in an amount sufficient to impart the desired viscosity to said aqueous coating composition.

4,415,684

UV-LIGHT STABILIZED COMPOSITIONS CONTAINING SUBSTITUTED 1,5-DIAZACYCLOALKANES

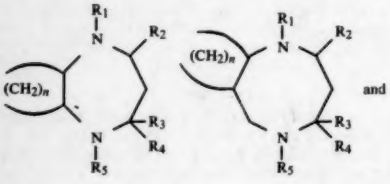
John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 122,936, Feb. 20, 1980, abandoned, which is a continuation-in-part of Ser. No. 835,069, Sep. 21, 1977, Pat. No. 4,207,228. This application Mar. 5, 1982, Ser. No. 355,167

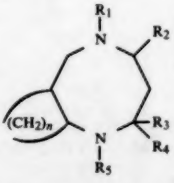
Int. Cl.³ C07D *243/12, 405/06, 405/10;* **C08K** *5/34*

U.S. Cl. 524—92 **8 Claims**

1. A composition of matter resistant to degradation by ultraviolet light comprising an ultraviolet light degradable normally solid polymer having dispersed therein from about 0.01 part to 5 parts by weight of a polysubstituted bicyclic 1,5-diazacycloalkane stabilizer, per 100 parts of said solid polymer, said stabilizer being represented by a moiety having a structure selected from the group consisting of



and



wherein,

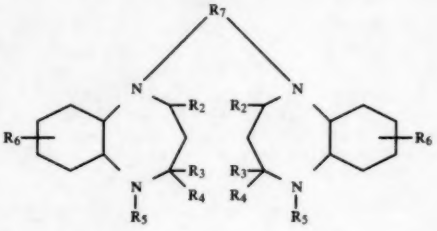
n is an integer in the range from 4 to 6;

R_1 and R_5 independently represent hydrogen, alkyl having from 1 to 24 carbon atoms, hydroxyalkyl having from 1 to 12 carbon atoms, ether having from 3 to 18 carbon atoms, hydroxyalkyl ether having from 4 to 18 carbon atoms, aralkyl having from 7 to 24 carbon atoms, and cycloalkyl having from 6 to 7 carbon atoms;

R_2 represents hydrogen or lower alkyl having from 1 to 5 carbon atoms; and

R_3 and R_4 independently represent alkyl having from 1 to 24 carbon atoms, cycloalkyl having from 5 to 14 carbon atoms, aralkyl having from 7 to 14 carbon atoms, and cyclizable alkylene having from 5 to 6 carbon atoms which alkylene together with the carbon atom of the diaza ring to which said alkylene is bound, represents cycloalkyl having from 6 to 7 carbon atoms.

5. A composition of matter resistant to degradation by ultraviolet light comprising an ultraviolet light degradable normally solid polymer having dispersed therein from about 0.01 part to 5 parts by weight of a bis compound of a polysubstituted bicyclic 1,5-diazacycloalkane stabilizer, per 100 parts of said solid polymer, said stabilizer being represented by two connected moieties each having a structure



wherein,

said bis compound consists essentially of said two moieties connected through one of the N atoms of each moiety, and the other N atom of each moiety is attached to a member selected from the group consisting of hydrogen, alkyl having from 1 to 24 carbon atoms, hydroxyalkyl having from 1 to 12 carbon atoms, ether having from 3 to 18 carbon atoms, hydroxyalkyl ether having from 4 to 18 carbon toms, aralkyl having from 7 to 24 carbon atoms, and cycloalkyl having from 6 to 7 carbon atoms;

R_2 and R_6 independently represent hydrogen or lower alkyl having from 1 to 5 carbon atoms;

R_3 and R_4 independently represent alkyl having from 1 to 24 carbon atoms, cycloalkyl having from 5 to 14 carbon atoms, aralkyl having from 7 to 14 carbon atoms, and cyclizable alkylene having from 5 to 6 carbon atoms which alkylene together with the carbon atom of the diaza ring to which said alkylene is bound, represents cycloalkyl having from 6 to 7 carbon atoms; and,

R_7 is selected from phenyl and $(CH_2)_p$ where p is an integer in the range from 2 to 10.

4,415,685

PROCESS FOR DYEING HIGH-MOLECULAR ORGANIC MATERIAL, AND NOVEL POLYCYCLIC PIGMENTS

Abul Iqbal, Ettingen, and Luigi Cassar, Kaiseraugst, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 16, 1982, Ser. No. 358,734

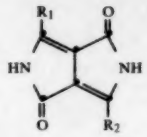
Claims priority, application Switzerland, Mar. 20, 1981, 1905/81

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—92 **11 Claims**

1. A process for dyeing high-molecular weight organic material in the bulk of which comprises

incorporating therein a 1,4-diketo-pyrrolo[3,4-c]pyrrole of formula I



(I)

wherein R_1 and R_2 are isocyclic or heterocyclic aromatic radicals.

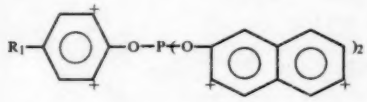
4,415,686

STERICALLY HINDERED PHENYL BIS(NAPHTHYL)PHOSPHITES AND COMPOSITIONS THEREOF

Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 24, 1982, Ser. No. 444,280
Int. Cl.³ C07F 9/145; C08K 5/52
U.S. Cl. 524—101 **20 Claims**

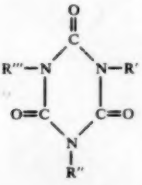
14. A composition comprising organic materials subject to degradation and stabilizing amounts of (1) hindered phenyl bis(naphthyl)phosphites having the formula



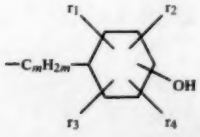
wherein

+ is t-butyl or t-pentyl; R_1 is hydrogen, an alkyl radical containing 1 to 9 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, halogen, an alkoxy radical containing 1 to 8 carbon atoms, phenyl, a t-alkyl radical containing 4 to 8 carbon atoms, and a

where R_6 is an alkyl radical containing 1 to 8 carbon atoms; and (2) hydroxyphenylalkyleneyl isocyanurates of the formula



wherein R′ is a hydroxyphenylalkyleneyl radical of the formula



where m is 1 to 4, r_1 is an alkyl radical having 1 to 18 carbon atoms and is positioned immediately adjacent to the hydroxy group on the ring; r_2, r_3, and r_4 are hydrogen or an alkyl radical containing 1 to 18 carbon atoms; and R″ and R‴ are hydrogen, an alkyl radical containing 1 to 18 carbon atoms, or are the same as R′.

4,415,687

ORGANIC COMPOUNDS

Lajos Ávár, Biel-Benken, Switzerland; Evelyne Kalt, Riedisheim, France, and Hellmuth Reinshagen, Heitersheim, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jul. 2, 1982, Ser. No. 394,399
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126604; Aug. 17, 1981, 3132420; Dec. 10, 1981, 3148921
Int. Cl.³ C08K 5/34; C07D 251/19, 211/32
U.S. Cl. 524—102 **16 Claims**

1. 1,3-dihydroxy-4,6-bis-4′-(2′,2′,6′,6′-tetramethylpiperidyl) benzene, its 1′-alkyl or 1′-(substituted alkyl) derivatives and monomeric or polymeric products derived from these compounds by substitution of 1- and 3-hydroxy groups and/or by the linking of hydroxy groups on adjacent units through a bridging group.

4,415,688

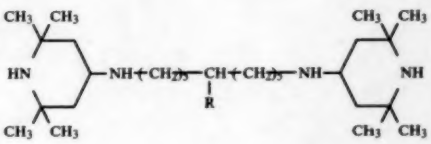
POLY(PIPERIDYLAMINE) ALKANES AND SYNTHETIC RESIN COMPOSITIONS STABILIZED THEREBY

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki; Toshihiro Shibata, Omiya, and Ryozo Arata, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

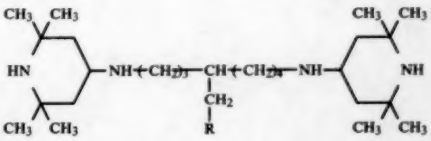
Filed Nov. 22, 1982, Ser. No. 443,274
Claims priority, application Japan, Nov. 27, 1981, 56-190274
Int. Cl.³ C08K 5/34; C08L 25/06
U.S. Cl. 524—102 **17 Claims**

1. Poly(piperidylamine)alkanes having one of Formula (I) or (II):

(I)

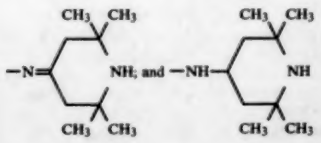


(II)



wherein:

R is selected from the group consisting of: $-NH_2$;



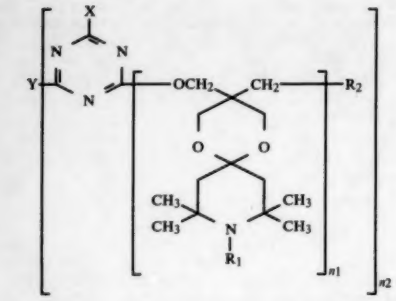
4,415,689

SYNTHETIC RESIN COMPOSITIONS CONTAINING 2,2,6,6-TETRAMETHYL PIPERIDINYL TRIAZINES

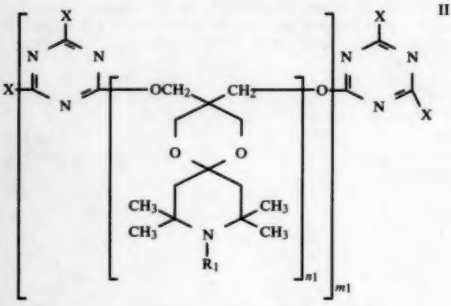
Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki, and Toshihiro Shibata, Omiya, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Sep. 7, 1982, Ser. No. 415,204
Claims priority, application Japan, Sep. 14, 1981, 81-145016
Int. Cl.[3] C08K 5/34; C07D 491/10
U.S. Cl. 524—103 30 Claims

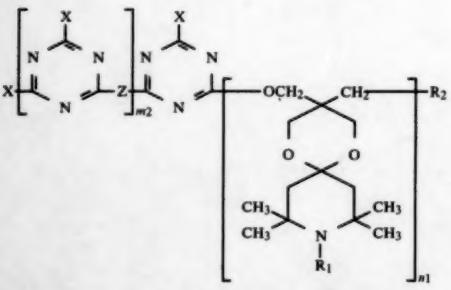
1. 2,2,6,6-Tetramethyl piperidinyl triazines having one of the formulae (I), (II) and (III):



I



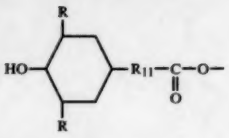
II



wherein:

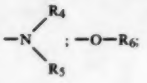
R_1 is selected from the group consisting of hydrogen, oxyl O, alkyl, alkenyl and hydroxyalkyl having from one to about twelve carbon atoms, phenalkyl having from seven to about twelve carbon atoms and acyloxyalkyl having from two to about twelve carbon atoms; and 2,3-epoxypropyl;

R_2 is selected from the group consisting of hydrogen, lower alkyl having from one to about five carbon atoms,

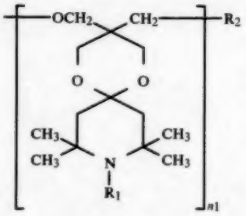


and —O—R_3 (wherein R is hydrogen or lower alkyl having from one to about five carbon atoms; and R_3 is hydrogen or acyl having from one to about twenty carbon atoms);

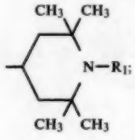
X is selected from the group consisting of



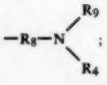
and



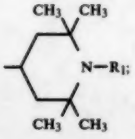
R_4 is selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms, aryl having from six to about fifteen carbon atoms, —$(CH_2)_p$—O—R_3 and



R_5 is selected from the group consisting of R_4 and



R_6 is selected from the group consisting of alkyl having from one to about eight carbon atoms, aryl having from six to about ten carbon atoms and

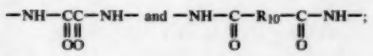


p is 1, 2 or 3;

R_7 is selected from the group consisting of hydrogen, alkyl

having from one to about eight carbon atoms and acyl having from about two to about five carbon atoms;

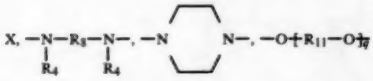
R_8 is selected from the group consisting of direct linkage, alkylene having from about two to about twelve carbon atoms; arylene having from six to about ten carbon atoms;



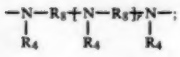
R_9 is selected from the group consisting of hydrogen, alkyl having from one to about eight carbon atoms, aryl having from six to about ten carbon atoms, and acyl having from about two to about ten carbon atoms;

R_{10} is selected from the group consisting of alkylene having from one to twelve carbon atoms and arylene having from six to ten carbon atoms;

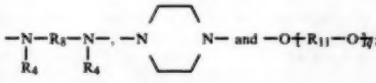
Y is selected from the group consisting of



and a more than three valent residue derived from a polyalcohol or a polyamine by elimination of active H atoms thereof, i.e.,



Z is selected from the group consisting of



q=1 to 20;

R_{11} is selected from the group consisting of alkylene having from two to about eight carbon atoms, alkylene cycloalkylene having from seven to about eighteen carbon atoms, and arylene having from six to about ten carbon atoms;

n_1 is 1, 2 or 3;

n_2 is a number from 1 to 50;

m_1 is a number from 1 to 20;

m_2 is a number from 2 to 20;

r is a number from 1 to 48.

21. A polyvinyl chloride resin composition having improved resistance to deterioration upon exposure to light comprising a polyvinyl chloride resin formed at least in part of the recurring group:

and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and a compound in accordance with claim 1.

4,415,690

SUCCINIC ANHYDRIDE DERIVATIVES AS A SCORCH INHIBITOR FOR CARBOXYLATED RUBBERS

Donald C. Grimm, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 17, 1982, Ser. No. 379,243

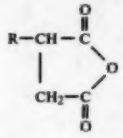
Int. Cl.³ C08K *5/15*

U.S. Cl. 524—112 **24 Claims**

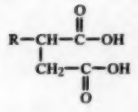
1. An improved scorch resistant carboxylic rubber composition comprising:

(a) a carboxylated rubber; and

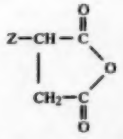
(b) at least one succinic anhydride derivative selected from the group consisting of alkenyl succinic anhydrides having the structural formula:



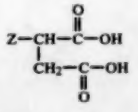
wherein R is an alkenyl moiety containing from 8 to 25 carbon atoms, inclusive; dicarboxylic acids having the structural formula:



wherein R is an alkenyl moiety containing from 8 to 25 carbon atoms, inclusive; alkyl succinic anhydrides having the structural formula:



wherein Z is an alkyl moiety containing from 8 to 25 carbon atoms, inclusive; and dicarboxylic acids having the structural formula:



wherein Z is an alkyl moiety containing from 8 to 25 carbon atoms, inclusive; which is distributed throughout said carboxylated rubber composition as a scorch inhibitor.

4,415,691

ANTI-BLOCK ADDITIVES FOR OLEFIN POLYMERS

James A. Allen; George W. Knight, both of Lake Jackson, and Morris S. Edmondson, Alvin, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 191,594, Sep. 29, 1980, Pat. No. 4,327,009. This application Mar. 18, 1982, Ser. No. 359,636
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ C08K 5/15
U.S. Cl. 524—114 10 Claims

1. A composition comprising a linear, low density ethylene copolymer having incorporated therein an amount in the range of about 0.04 to about 4 weight percent of at least one block-reducing agent comprising a liquid organic having a molecular weight in the range of about 300 to about 5000, a Saybolt viscosity of at least 100 centistokes at 25° C., and a boiling point above about 285° C.

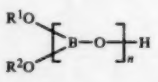
4,415,692

STABILIZED THERMOPLASTIC MOULDING COMPOSITIONS

Karsten Idel; Hans-Josef Buysch, both of Krefeld; Horst Peters, Leverkusen, and Josef Buekers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

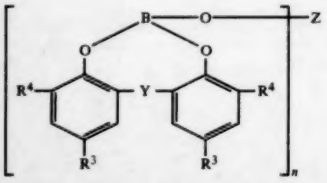
Filed May 29, 1981, Ser. No. 268,365
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021726
Int. Cl.³ C08K 5/55
U.S. Cl. 524—183 3 Claims

1. A mixture consisting essentially of an aromatic carbonate. an ABS polymer and from 0.01 to 3.0% by weight, based on the weight of the mixture, of a stabilizer selected from the group consisting of



(I)

wherein n is 1 and R^1 and R^2 are each C_1–C_{18} alkyl, C_5–C_{15} cycloalkyl, C_7–C_{24} aralkyl or alkaryl or C_6–C_{24} aryl and



(III)

wherein n is an integer of from 1 to 4, Z is hydrogen or an aliphatic, cycloaliphatic or aromatic hydrocarbon group having 1–18 carbon atoms, R^3 and R^4 are each a C_1–C_9 aliphatic hydrocarbon, a C_5–C_6 cycloaliphatic hydrocarbon, or a C_7–C_9 aralkyl or a C_6–C_{10} aryl group and Y is HCR^5 wherein R^5 is hydrogen, a C_1–C_6 alkyl, a cyclohexenyl or a cyclohexyl group.

4,415,693

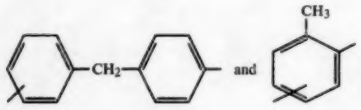
STABILIZATION OF POLYESTERAMIDES WITH URETHANES

Augustin T. Chen, Cheshire; Robert G. Nelb, II, and Kemal Onder, both of New Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 9, 1982, Ser. No. 406,126
Int. Cl.³ C08K 5/20; C08L 77/12
U.S. Cl. 524—198 17 Claims

1. A composition comprising a blend of at least about 75 percent by weight of a polyesteramide having recurring amide and ester linkages which are joined by divalent radicals selected from the group consisting of alkylene, arylene, cycloalkylene, blocks derived from polyester polymers which in turn are derived from a dicarboxylic acid or mixture of two or more such acids and an excess of a hydrocarbyl alkane diol having 2 to 8 carbon atoms or mixtures of two or more such diols, blocks derived from polyamide polymers, and mixtures thereof and the balance of the blend comprising a urethane containing ingredient.

4. A composition comprising a blend of (1) about 75 to about 98 percent by weight of a thermoplastic polyesteramide having the recurring unit —(BCOOAOOC)$_m$BCO—(NHRNHCOD-CO)$_x$NHRNHCO— wherein R is selected from the class consisting of arylene of the formulae



and mixtures thereof, A is the residue of a polymeric polyster diol HO—A—OH having a molecular weight from about 400 to about 4000, which diol is derived from a dicarboxylic acid or mixture of two or more such acids and an excess of hydrocarbyl alkane diol having 2 to 8 carbon atoms, or mixtures of two or more of the latter diols, B is the residue of a dicarboxylic acid HOOC—B—COOH wherein B is a divalent radical selected from the class consisting of alkylene having 4 to 12 carbon atoms, inclusive, 1,4-phenylene, and 1,3-phenylene, m has a mean value of less than 1 and greater than O, D is the residue of a dicarboxylic acid HOOC—D—COOH such that the melt temperature of the hard segment is not greater than 280° C., and x is a number having an average value from zero to 10; and (2) about 2 to about 25 percent by weight of a thermoplastic polyurethane.

4,415,694

CONTACT ENHANCING COMPOSITION

Russell A. Roiko, Rogers, and Richard J. Pokorny, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 283,286, Jul. 14, 1981, abandoned. This application May 18, 1982, Ser. No. 379,340
Int. Cl.³ C08K 5/20
U.S. Cl. 524—200 25 Claims

1. A soft, deformable composition comprising an admixture of:

a. an effective amount of an anhydride copolymer,

b. an effective amount of a flexibilizing polymer selected from polyisobutylene, styrene olefin styrene block polymer, and polymers of ethylene copolymerized with vinyl acetate, vinyl acrylate, vinyl methacrylate, and alpha-olefins;

c. an effective amount of a hydrophobic, compatible, fluoroaliphatic radical-containing composition,

d. up to 5 weight percent of the composition of a mercaptan compound, and

e. an effective amount of an antioxidant compound.

4,415,695

METHOD FOR PREPARING COLOR-FREE, STABILIZED POLYMERS OF CONJUGATED DIENES OR VINYL AROMATIC HYDROCARBONS OR COPOLYMERS OF CONJUGATED DIENES AND VINYL AROMATIC HYDROCARBONS

Sunil B. Sarkar, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 25, 1982, Ser. No. 362,175
Int. Cl.[3] C08K *3/38*
U.S. Cl. 524—405 15 Claims

1. A method of preparing an essentially color-free, stabilized polymer of a conjugated diene or vinyl aromatic hydrocarbon or a copolymer of a conjugated diene and a vinyl aromatic hydrocarbon comprising:

(a) preparing a living polymer of a conjugated diene or vinyl aromatic hydrocarbon or a copolymer of a conjugated diene and a vinyl aromatic hydrocarbon by anionically polymerizing the conjugated diene or vinyl aromatic hydrocarbon or anionically copolymerizing the conjugated diene and the vinyl aromatic hydrocarbon using a lithium-based catalyst and an inert hydrocarbon diluent;

(b) adding a terminating agent to said living polymer or copolymer;

(c) adding boric acid to the terminated polymer or copolymer in sufficient amount to prevent or substantially reduce the formation of color;

(d) adding stabilizing agents to said polymer or copolymer; and

(e) recovering an essentially color-free, stabilized polymer or copolymer.

4,415,696

AROMATIC POLYCARBONATE COMPOSITIONS CONTAINING A C_{16}–C_{36}ALKANE COMPOUND AS A MOLD RELEASE AGENT

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 7, 1981, Ser. No. 327,949
Int. Cl.[3] C08K *5/01*
U.S. Cl. 524—490 13 Claims

1. A composition consisting essentially of an aromatic polycarbonate resin and a mold release effective amount of a single normal alkane having from about 16 to about 36 carbon atoms, inclusive.

4,415,697

PAINT COMPOSITION COMPRISING HYDROXY FUNCTIONAL FILM FORMER AND CROSSLINKED DISPERSION FLOW CONTROL ADDITIVE

Stephen C. Peng, Utica, and John D. Nordstrom, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 199,394, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,395, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,761, Oct. 23, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 292,858
Int. Cl.[3] C08G *12/32;* C08L *61/28;* C08F *220/10, 2/14*
U.S. Cl. 524—512 49 Claims

1. A coating composition comprising:

(I) a film forming component comprising hydroxy functional copolymer having a number average molecular weight (M_n) of from greater than about 150 up to about 20,000 and a glass transition temperature (T_g) ranging from between about −25° C. and about 70° C., said copolymer being formed from about 5 to about 50 weight percent of hydroxy functional monoethylenically unsaturated monomers and between about 95 and about 50 weight percent of other monoethylenically unsaturated monomers;

(II) crosslinking agent selected from amino compounds and isocyanate compounds; and

(III) A flow control additive in an amount ranging from about 0.5 to about 30 parts of resin solids in said flow control additive per 100 parts of total resin solids in said composition, said flow control additive comprising a stable, crosslinked dispersion containing microgel particles, said dispersion being formed by addition polymerization of

(a) between about 1 and about 10 mole percent each of first and second ethylencially unsaturated monomers each bearing functionality capable of crosslinking reaction with the other and

(b) between about 98 and about 80 mole percent of at least one other monoethylenically unsaturated monomer in the presence of: (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer comprising the reaction product of ethylenically unsaturated monomers (A) and copolymer reactant (B),

said ethylenically unsaturated monomers (A) bearing functionality capable of condensation reaction with complementary functionality of said copolymer reactant (B) which comprises a random copolymer of

(i) between about 20 and about 45 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially insoluble in said organic liquid,

(ii) between 40 and about 75 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially soluble in said organic liquid; and

(iii) between about 2 and about 15 weight percent of ethylenically unsaturated monomers bearing said complementary functionality capable of condensation reaction with said ethylenically unsaturated monomers (A),

said ethylenically unsaturated monomers (A) being reacted with said copolymer reactant (B) in an amount sufficient to react with at least about 10 percent of said complementary functionality of said copolymer reactant (B), wherein said addition polymerization is carried out at elevated temperature such that the dispersion polymer is first formed and then crosslinked.

4,415,698

METHOD OF PREPARING WATER-BORNE COLLOIDAL DISPERSIONS OF VINYL RESINS

You-Ling Fan, East Brunswick, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 104,070, Dec. 17, 1979, abandoned. This application Dec. 23, 1981, Ser. No. 333,892 The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.
Int. Cl.[3] C08F *27/06*
U.S. Cl. 524—521 3 Claims

1. Method of preparing water-borne colloidal dispersions of vinyl resins selected from the group consisting of vinyl chloride, vinylidene chloride or vinyl chloride/vinylidene chloride copolymers having carboxylic or sulfonic acid groups contained therein which comprises:

(A) blending said resins with:

(a) water;

(b) water-miscible base;

(c) at least one water-miscible organic solvent which is a good solvent for said resins and boils below about 160° C.;

(d) an organic and water-miscible cosolvent which is a poor solvent for said resins but is miscible with the organic solvent (c); and

(e) about 1 to about 49 parts by weight of a water-immiscible organic diluent per hundred parts by weight of organic solvent (c) until a colloidal dispersion forms;

(B) stripping off the colloidal dispersion until the total content of organic solvents (c) and (d) and diluent (e) of the colloidal dispersion is about 0.2 to about 20% by volume; and then

(C) mixing an effective amount of an acrylic internally cross-

linked rheology modifier with the colloidal dispersion from (B) until a stable, colloidal dispersion is obtained.

4,415,699
EXTRUDED PROFILES

Eric Nield, Watton-At-Stone, and Martin K. Thompson, Biggleswade, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 23, 1981, Ser. No. 276,640
Claims priority, application United Kingdom, Jul. 14, 1980, 8022949
Int. Cl.³ C08L 77/06, 67/02
U.S. Cl. 524—538 4 Claims

1. A method of extruding a profile section comprising intimately blending and extruding a blend of a linear polyamide, a linear polyester containing at least 80% by weight of ethylene terephthalate units and an inorganic fibrous filler, wherein the composition contains 5 to 60% by weight of the composition of the fibrous filler and the weight ratio of polyamide to polyester is between 2:1 and 19:1, said composition being extruded through a die of profiled section wherein the melt flow index of the composition is not greater than 2 measured according to ASTM-D1238 using a standard die of bore 2.096 mm, length 8 mm and a load of 2.16 kg at a temperature of 285° C. and the polyamide contains at least 20 g equivalents of terminal amino groups per 10^6 of polyamide in excess of the carboxyl groups.

4,415,700
HYDROPHILIC LATEX PARTICLES AND USE THEREOF

Hans-Georg Batz, Tutzing; Paul Tanswell, Planegg; Manfred Baier, Pöcking-Possenhofen, all of Fed. Rep. of Germany; Karel Bouchal; Jaroslav Kalal, both of Prague; Frantisek Svec, Hrebec, and Eva Zarkova, Prague, all of Czechoslovakia, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany and Tschechoslowakische Academie der Wissenschaften, Prague, Czechoslovakia

Filed Dec. 16, 1981, Ser. No. 331,114
Claims priority, application Czechoslovakia, Dec. 23, 1980, 9235-80; Fed. Rep. of Germany, Dec. 23, 1980, 3048883
Int. Cl.³ C08L 33/00, 37/00; C08F 20/32; G01N 33/54
U.S. Cl. 524—548 30 Claims

1. Hydrophilic latex particles which are sparingly soluble in water consisting of a homo- or co-polymer of monomers containing at least one epoxy group and at least one polymerizable carbon-carbon double bond in the molecule.

4,415,701
WATER SOLUBLE THICKENERS

Barry J. Bauer, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 12, 1982, Ser. No. 434,144
Int. Cl.³ C08G 65/08, 4/00
U.S. Cl. 524—612 15 Claims

1. A water soluble thickening compound comprising a copolymer prepared by copolymerizing about 0.5% to about 20%, by weight, of a C_{10}–C_{36} monoepoxide with about 99.5% to about 80%, by weight, of a 1,3 dioxolane.

4,415,702
RUBBERIZED ASPHALT COMPOSITION AND PROCESS FOR PRODUCING SAME

Katsuhiro Ono, Ichikawa, and Shigeki Sakimura, Tokyo, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 9, 1982, Ser. No. 347,259
Int. Cl.³ C08L 95/00
U.S. Cl. 524—705 18 Claims

1. A rubberized asphalt composition which comprises moisture-curing diene polymer liquid rubber, asphalt and aggregates, said liquid rubber being in an amount of from 4 to 10 percent based on the total weight of said liquid rubber and said asphalt; and said liquid rubber having a molecular weight of from 500 to 50,000 and having an isocyanate group as a functional group at the terminals of the molecule for cross-linking when contacted with water.

4,415,703
AQUEOUS DISPERSION OF A CELLULOSE DERIVATIVE

Hirotaka Toba, Ohimachi; Masatoshi Mikumo, Kamiitabashi, and Masahiro Asami, Ohimachi, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Jan. 6, 1982, Ser. No. 337,336
Claims priority, application Japan, Jan. 13, 1981, 56-3506; Jan. 13, 1981, 56-3507; Apr. 16, 1981, 56-57500; Aug. 28, 1981, 56-135939
Int. Cl.³ C08L 1/08; C08G 59/02
U.S. Cl. 525—54.21 16 Claims

1. An aqueous dispersion of a polymer composition which dispersion has been prepared by emulsion polymerizing, under radical polymerization conditions, at least one radical-polymerizable, ethylenically unsaturated monomer A, in the presence of water, at least one cellulose derivative B which is dissolved in said monomer A and a water-soluble or water-dispersible dispersion stabilizer C, said dispersion stabilizer C being a high molecular weight polymeric product consisting essentially of

(1) a hydrophilic polymer chain portion made of at least one water-soluble polymer having a functional group in the molecule and having a number average molecular weight in the range of from 300 to 100,000, and

(2) an oleophilic polymer chain portion made of at least one water-insoluble polymer having a reactive group in the molecule and having a molecular weight in the range of from 300 to 200,000, said reactive group of said water-insoluble polymer being reacted with said functional group of said water-soluble polymer to form a bond which is not dissociated in water, said water-insoluble polymer being soluble in said monomer A and being miscible with the polymer of said monomer A,

so that said oleophilic polymer chain portion is fixed in the particles of the polymer of said monomer A in the dispersion, and said hydrophilic polymer chain portion is present in the aqueous phase of the dispersion.

5. An aqueous dispersion as claimed in claim 1 in which said water-soluble polymer is a polymer of at least one radical-polymerizable, ethylenically unsaturated monomer.

4,415,704
ELASTOMERIC INTERPOLYMER BLENDS

Arthur H. Weinstein, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 155,878, Jun. 6, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,296
Int. Cl.³ C08L 7/00, 9/00, 9/04, 9/06
U.S. Cl. 525—76 6 Claims

1. A blend of (A) a thermoplastic material comprising a mixture of polyvinyl chloride reson and acrylonitrile/-butadiene/styrene resin or (B) a rubber material selected from the group consisting of styrene/butadiene rubber and a mixture of styrene/butadiene rubber and natural rubber with (C) an elastomeric interpolymer which is a polyhaloacrylate/butadiene interpolymer prepared by aqueous emulsion polymerizating at a temperature in the range of about 5° C. to about 60° C., in the presence of a free radical generating catalyst selected from the group consisting of bis-azo isobutyronitrile, potassium persulfate, ammonium persulfate, benzoyl peroxide, p-menthane hydroperoxide, cumene hydroperoxide and mixtures thereof with a fatty acid soap, cationic, non-ionic and organic sulfate or sulfonate emulsifier, a monomer mixture of (1) 1,3-butadiene, (2) a monomer selected from the group consisting of pentachlorophenyl methacrylate, 2,4,6-tribromophenyl methacrylate. 2,4,6-tribromophenyl methacrylate, 2,3,4,6-tetrachlorophenyl acrylate, 2,4,6-trichlorophenyl acrylate, penta-

bromophenyl acrylate, 2,4,6-tribromophenyl acrylate, 2,4-dibromophenyl methacrylate, 2,3,4,6-tetrachlorophenyl methacrylate, pentachlorothiophenyl methacrylate, pentabromophenyl methacrylate, pentachlorothiophenyl acrylate, N-2,4,6-tribromophenyl acrylamide, N-2,4,6-tribromophenyl methacrylamide and mixtures thereof, and optionally (3) styrene; provided that when the elastomeric interpolymer (C) contains about 60 to 70 percent by weight of 1,3-butadiene units, there are present 60–80 parts of (C) with 80 to 100 parts acrylonitrile/Butadiene/styrene resin to 100 parts of polyvinyl chloride resin, and when (C) contains 30 to 35 percent weight of 1,3-butadiene units, there are present 100 to 130 parts of (C) with 35 to 60 parts of acrylonitrile/butadiene/styrene resin to 100 parts of polyvinyl chloride resins; and also provided that when (C) contains about 62 percent by weight of 1,3-butadiene units, there are present at least 31 parts of (C) with up to 60 parts of styrene/butadiene copolymer rubber, and when (C) contains about 60 percent by weight of 1,3-butadiene units, as well as about 20 percent by weight of styrene units, there are present at least about 35 pars of (C) with 100 parts of a mixture of styrene/butadiene copolymer rubber and natural rubber.

4,415,705

ROSIN DERIVATIVES USED AS DISPERSANTS

G. Frederick Hutter, Upper Montclair, N.J., assignor to Inmont Corporation, Clifton, N.J.

Filed Jul. 19, 1982, Ser. No. 399,643

Int. Cl.³ B01F *17/52;* **C08K** *5/01, 5/02;* **C09D** *11/02*

U.S. Cl. 525—167.5 **8 Claims**

1. A dispersing agent formed by reacting a poly (lower alkylene) imine, having mol. wt. of 1,000 to 15,000 with a polyester containing free carboxylic acid groups, said polyester comprising the esterification product of hydroxy stearic acid, or its oligomer, with tall oil rosin.

4,415,706

COMPATIBLE BLENDS OF POLYGLUTARIMIDES AND POLYAMIDES

William H. Staas, Churchville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 10, 1982, Ser. No. 440,672

Int. Cl.³ C08L *77/10*

U.S. Cl. 525—183 **32 Claims**

1. A compatible polymer blend comprising from about 1 to about 99 percent by weight of an imidized acrylic polymer, containing at least 5 percent by weight glutarimide units, and from about 99 to about 1 percent by weight of a polyamide or mixtures of polyamides.

4,415,707

PROCESSING MODIFIER FOR POLYOLEFINS

Robert R. Blanchard, Brusly, and Tommy R. Bourne, Baton Rouge, both of La., assignors to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 284,419, Jul. 20, 1981, Pat. No. 4,342,848. This application Jul. 22, 1982, Ser. No. 401,052

The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

Int. Cl.³ C08L *23/04, 23/12, 23/06, 29/10*

U.S. Cl. 525—231 **4 Claims**

1. A process for extruding polyolefin resins, comprising the steps of:

(a) heating above its melting point a mixture comprising about one hundred parts by weight of a polyolefin resin, and between about 0.03 and about 0.5 parts by weight of a polyvinyloctadecyl ether; and

(b) extruding the melt formed in step (a) thereby forming an extrudate.

4,415,708

THREE STAGE GRAFT POLYMERIZATION PROCESS FOR PREPARING NITRILE BASED RESINS

Shoichi Matsumura; Yoshihiko Hashimoto; Hiroyasu Furukawa, and Masaaki Azuma, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 108,472, Dec. 31, 1979, abandoned. This application Sep. 16, 1981, Ser. No. 302,754

Claims priority, application Japan, Dec. 30, 1978, 53-165054

Int. Cl.³ C08F *279/02, 279/04*

U.S. Cl. 525—316 **3 Claims**

1. A nitrile based resin produced by graft polymerizing in a first polymerization step, in the presence of a rubber comprising at least 50 weight percent 1,3-conjugated diene, a first group of monomers, and in which first polymerization step said first group of monomers is substantially completely polymerized; then, in a second consecutive and separate polymerization step, grafting onto the product of said first polymerization step, a second group of monomers, until said second group of monomers is substantially completely polymerized; and finally, in a third consecutive and separate polymerization step, grafting onto the product of said second polymerization step, a third group of monomers until said third group of monomers is substantially completely polymerized; said resin thus produced by said three consecutive and separate steps of polymerization, consisting essentially of

(A) 5 to 25 parts by weight of said rubber consisting essentially of at least 50 weight percent 1,3-conjugated diene, remainder one or more monomers copolymerizable therewith; and

(B) 75 to 95 parts by weight of the following:

(I) 5 to 40 weight percent of said product of said first polymerization step consisting essentially of "X" weight percent first component selected from the group consisting of acrylonitrile, methacrylonitrile and mixtures thereof, and "100−X" weight percent second component consisting essentially of 20 to 100 weight percent aromatic vinyl compound selected from the group consisting of styrene, substituted styrene, alpha methyl styrene and substituted alpha methyl styrene, 0 to 80 weight percent of a monomer consisting essentially of 30 weight percent or more alkyl acrylate and/or alkyl methacrylate, and not more than 30 weight percent of vinyl monomers excluding said aromatic vinyl compound, said alkyl acrylate and said alkyl methacrylate;

(II) 2 to 35 weight percent of said product of said second polymerization step consisting essentially of "Y" weight percent third component selected from the group consisting of acrylonitrile, methacrylonitrile, and mixtures thereof, and "100−Y" weight percent fourth component consisting essentially of 20 to 100 weight percent aromatic vinyl compound selected from the group consisting essentially of styrene, substituted styrene, alpha methyl styrene, and substituted alpha methyl styrene, 0 to 80 weight percent of a monomer consisting essentially of 30 weight percent or more alkyl acrylate and/or alkyl methacrylate, and not more than 30 weight percent of vinyl monomers excluding said aromatic vinyl compound, said alkyl acrylate and said alkyl methacrylate; and

(III) 25 to 93 weight percent of said product of said third polymerization step consisting essentially of "Z" weight percent fifth component selected from the group consisting of acrylonitrile, methacrylonitrile and mixtures thereof, and "100-Z" weight percent sixth component consisting essentially of 20 to 100 weight percent aromatic vinyl compound selected from the group consisting of styrene, substituted styrene, alpha methyl styrene and substituted alpha methyl styrene, 0 to 80 weight percent of a monomer consisting essentially of 30 weight percent or more alkyl acrylate and/or alkyl methacrylate, and not more than 30 weight percent of

vinyl monomers excluding said aromatic vinyl compound, said alkyl acrylate and said alkyl methacrylate; and wherein the amount of said first component, of said third component, and of said fifth component are governed by the following ranges:

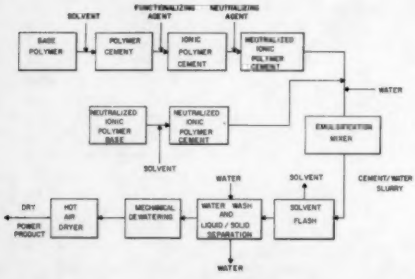
$30 \leqq X < 60$; $30 \leqq X < Y < Z \leqq 85$; $60 < Z \leqq 85$.

4,415,709

PROCESS FOR FORMING POWDERS FROM ION CONTAINING POLYMERS

Robert R. Klein, Berkeley Heights, N.J., and Henry S. Makowski, deceased, late of Scotch Plains, N.J. (by Patricia H. Makowski, executrix), assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 136,374, Apr. 1, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,583
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ C08F *8/36, 8/44*
U.S. Cl. 525—344 **11 Claims**



1. A process for forming a powder of a metal, ammonium or amine neutralized sulfonated polymer, wherein said neutralized sulfonated polymer is derived from an EPDM terpolymer, a Butyl rubber or polystyrene, said powder having a particle size distribution of about 500 to about 3000 microns and a volume density of about 10 lbs/ft^3 to about 25 lbs/ft^3, which comprises the steps of:

(a) contacting a quenched cement of a polymer dissolved in a hydrocarbon solvent with a sulfonating agent to form an unneutralized sulfonated polymer;

(b) adding an amine or neutralizing agent which is a basic salt to said cement, wherein a counterion of said basic salt is selected from the group consisting of ammonium, antimony, iron, lead and Groups IA, IIA, IB and IIB of the Periodic Table of Elements;

(c) adding water to said cement to gel said cement, wherein the volume ratio of water to cement is about 60:1 to about 2:1;

(d) suspending said gel to form a slurry of cement particles of said neutralized sulfonated polymer;

(e) removing said solvent from said slurry;

(f) separating said particles of said powder from said water; and

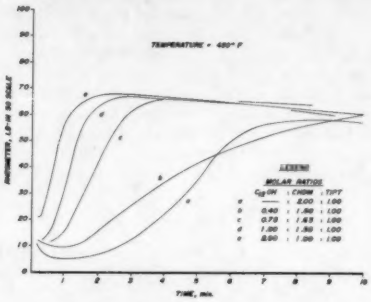
(g) drying said particles of said powder.

4,415,710

CURABLE COMPOSITIONS, BASED ON ALKYLENE-ALKYL ACRYLATE COPOLYMERS, CONTAINING PREFORMED, REACTIVE ORGANO TITANATE CATALYSTS

Austin E. Barnabeo, and Michael J. Keogh, both of Bridgewater, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 28, 1981, Ser. No. 334,673
Int. Cl.³ C08J *3/24*
U.S. Cl. 525—370 **17 Claims**


TEMPERATURE = 400° F
TORQUE, LB-IN SCALE
TIME, min.
LEGEND
MOLAR RATIO
$C_{18}OH$: CHDM : TPT
a —— : 2.00 : 1.00
b 0.40 : 1.60 : 1.00
c 0.70 : 1.43 : 1.00
d 1.00 : 1.50 : 1.00
e 2.00 : 1.00 : 1.00

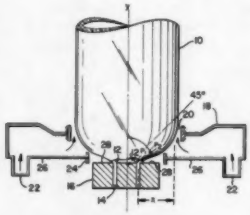
1. A curable composition comprising an alkylene-alkyl acrylate copolymer, and in an amount sufficient to cure said copolymer to a crosslinked product, a preformed, reactive catalyst which is the reaction product of an organo titanate, a diol having two primary hydroxy groups attached to non-adjacent carbon atoms and a monohydric alcohol.

4,415,711

PROCESS FOR FORMING FILM FROM LOW STRAIN HARDENING POLYMERS

David N. Jones, Long Valley, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 2, 1982, Ser. No. 394,672
Int. Cl.³ B29D *7/22*; C08F *2/34*
U.S. Cl. 526—88 **63 Claims**



1. A process for forming a blown film from a normally solid thermoplastic resin having an extensional viscosity index of less than about 6 which comprises extruding said resin through the die lips of a tubular film die to form a molten tube, expanding said molten tube radially at an angle of at least 45° as measured from the longitudinal axis of said expanding film bubble, said angle being substantially maintained at at least 45° for a distance of at least one inch along the longitudinal cross-section taken through the longitudinal axis of said expanding film bubble and thereafter contacting said film bubble with a primary cooling stream.

62. Films produced according to the process of claim **1**.

4,415,712
POLYMERIZING OLEFINS WITH CATALYSTS CONTAINING THE REACTION PRODUCT OF A TRANSITION METAL COMPOUND AND A BORON COMPOUND

Randall S. Shipley, Alvin, and Larry E. Freyer, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1982, Ser. No. 353,266
Int. Cl.³ C08F 4/02, 10/00
U.S. Cl. 526—122 **31 Claims**

1. A process for polymerizing one or more α-olefins which comprises conducting the polymerization under Ziegler polymerization conditions in the presence of a catalyst composition containing:

the catalytic reaction product of

(A) the reaction product or complex formed from the admixture of

(1) at least one transition metal compound represented by the formulae $Tm(OR)_yX_{x-y}$ or $Tm(OR)_{x-2}O$, wherein Tm is a transition metal selected from groups IVB, VB or VIB; each R is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; each X is independently a halogen; x has a value equal to the valence of Tm and y has a value from 1 to the valence of Tm; and

(2) at least one boron compound represented by the empirical formula BX_3

(B) a magnesium halide resulting from the reaction of

(1) an organomagnesium compound represented by the empirical formula $MgR''_{2-x}MR''_y$ wherein M is aluminum or zinc, each R'' is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, x has a value from zero to 10 and y has a value corresponding to the valence of M; with

(2) a halide source selected from

(a) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen or

(b) a metallic halide corresponding to the formula $MR'_{y-a}X_a$ wherein M is a metal of Group IIB, IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl radical, X is halogen, y is a number corresponding to the valence of M and a is a number of 1 to y; and

(C) when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, an aluminum compound represented by the empirical formula $AlR'_{y'}X_{y''}$ wherein R and X are as defined above and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three;

and wherein the components are employed in quantities which provide an atomic ratio of the elements Mg:Tm of from about 1:1 to about 200:1; B:Tm at least about 0.1:1; Al:Tm of from about 0.1:1 to about 200:1 and an excess X:Al of from about 0.0005:1 to about 5:1.

4,415,713
HIGH ACTIVITY SUPPORTED CATALYTIC COMPONENTS AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Shoichi Tokunaga, Tokyo; Atsumi Kato, Hikari; Tatsuo Kimoto, and Keikichi Baba, both of Shinnanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 189,334, Sep. 22, 1980, abandoned, which is a continuation of Ser. No. 954,764, Oct. 26, 1978, abandoned. This application Oct. 26, 1981, Ser. No. 315,064
Claims priority, application Japan, Nov. 4, 1977, 52-132201
Int. Cl.³ C08F 4/02, 10/06
U.S. Cl. 526—125 **4 Claims**

1. A high activity supported catalytic component which is prepared by pulverizing together an admixture of: (a) activated anhydrous magnesium chloride, the anhydrous magnesium chloride being activated by: (i) heating the anhydrous magnesium chloride to at least 100° C.; (ii) degassing the resulting heated anhydrous magnesium chloride under reduced pressure; and (iii) pulverising the degassed anhydrous magnesium chloride under an inert gas atmosphere; (b) 0.5 to 10 parts by weight of a titanium compound, reported as titanium, per 100 parts by weight of the activated anhydrous magnesium chloride, said titanium compound being a combination or complex of a halogen-containing tetravalent titanium compound and 0.1 to 200 moles of an ester per 100 moles of the halogen-containing tetravalent titanium compound; (c) 0.1 to 10 weight % of a liquid aromatic hydrocarbon and/or a liquid aromatic hydrocarbon halide based on the total weight of the magnesium chloride, the halogen-containing tetravalent titanium compound and the ester; and (d) 5 to 95 parts, per 100 parts by weight of said (a), (b) and (c), of a solid diluent selected from the group consisting of boron oxide, titanium oxide, aluminum oxide, silicon oxide and magnesium oxide; said pulverization being carried out at a temperature which is within the range of 0° to 25° C. and at which said liquid aromatic hydrocarbon and/or said liquid aromatic hydrocarbon halide remains in a liquid state throughout the whole range of temperature during said pulverization.

4,415,714
CATALYST AND METHOD FOR PREPARATION OF DRAG REDUCING SUBSTANCES

Mark P. Mack, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 606, Jan. 2, 1979, abandoned, and Ser. No. 7,125, Jan. 29, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,264
Int. Cl.³ C08F 4/64, 10/00
U.S. Cl. 526—125 **12 Claims**

1. A method for the production of non-crystalline hydrocarbon soluble ultrahigh molecular weight drag reducing polymers comprising

(a) preparing under an inert atmosphere a catalyst comprising;

(1) titanium trichloride

(2) a co-catalyst comprising an organo-aluminum or organo-aluminum halide of the general formula AlR_nX_{3-n} where R is a hydrocarbon radical, X is a halogen or hydrogen and n is 2 or 3; and a

(3) a monoether compound of the general formula R_1OR_2, wherein R_1 and R_2 are, independently, aryl, alkyl, cycloalkyl, aralkyl or alkaryl each containing from 1 to 20 carbon atoms and placing the catalyst in contact with;

(b) C_2–C_{30} α-monoolefinic hydrocarbons under temperature conditions suitable to form high molecular weight polymers, then

(c) ceasing polymerization at a polymer content level of 20% by weight or less, based on the total reaction mixture.

4,415,715
CATALYSTS FOR RING-OPENING COPOLYMERIZATION OF CYCLOOLEFINS

Anthony J. Bell, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 272,635, Jun. 11, 1981. This application Jan. 10, 1983, Ser. No. 456,677
Int. Cl.³ C08F 4/78, 232/08
U.S. Cl. 526—142 **3 Claims**

1. A method for copolymerizing a hexachlorocyclopentadiene-1,5-cyclooctadiene adduct (Hex COD) and a cycloolefin, other than cyclohexene, having from 4 to 12 carbon atoms and at least one non-conjugated double bond, comprising the steps of:

utilizing a catalyst consisting of (a) the reaction product of from 0.9 to about 1.5 moles of tungsten hexachloride and one mole of a 1,2- or 1,3-dioxy compound selected from

the group consisting of 2,4-pentadione, 2-formylphenol, 1,2-dihydroxybenzene, 1,3-diphenyl-1,3-propanedione, and (b) a compound having the formula R-$AlCl_2$ wherein R is an alkyl group having from 2 to 5 carbon atoms, the molar ratio of (b) to (a) ranging from about 2 to about 6, by which a more favorable Hex COD/cycloolefin comonomer reactivity ratio is achieved, and carrying out said copolymerization at a temperature of from about minus 10° C. to about plus 40° C.

4,415,716

PROCESS FOR THE POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Claes O. A. Lundin, Saltsjö-boo, and Berit I. Simonsson, Solna, both of Sweden, assignors to KenoGard AB, Stockholm, Sweden

Filed Jan. 27, 1981, Ser. No. 228,951
Claims priority, application Sweden, Jan. 28, 1980, 8000668
Int. Cl.³ C08K 5/06
U.S. Cl. 526—209 **10 Claims**

1. A method in the polymerization of ethylenically unsaturated monomers in aqueous systems wherein a solid, monomer-soluble, free-radical forming compound is used as initiator and this is added to the polymerization system in the form of an aqueous dispersion, characterized in that the initiator dispersion comprises an emulsifier system consisting of (a) an ethoxylated nonionic emulsifier with an HLB-value above 15, which emulsifier does not contain cyclic inner ether bonds, and (b) a non-ethoxylated nonionic emulsifier with an HLB-value below 9, whereby the resulting HLB-value of the emulsifier blend is within the range of 11–17 and whereby the total amount of emulsifier is at least 1 percent by weight, based on the initiator.

4,415,717

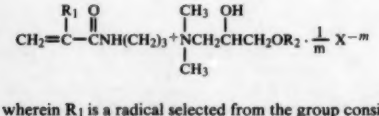
POLYMERIC CATIONIC SUBSTITUTED ACRYLAMIDE SURFACTANTS

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,093
Int. Cl.³ C08F 220/60
U.S. Cl. 526—287 **14 Claims**

1. A copolymer which consists of:

(A) a quaternary ammonium monomer of the general formula:



wherein R_1 is a radical selected from the group consisting of hydrogen and methyl and R_2 is a linear alkyl radical of from 8 to 20 carbon atoms, X is an anion or an organic or mineral acid having a valence of m; and

(B) from 50 wt% to 97 wt% of acrylamide.

4,415,718

TERPOLYMER PRODUCED FROM ETHYLENE, PROPYLENE AND BUTYLENE-1

Mituji Miyoshi, Kanagawa; Kazuo Matsuura, Kawasaki, and Yoshio Tajima, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Division of Ser. No. 184,238, Sep. 5, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 348,741
Claims priority, application Japan, Sep. 5, 1979, 54-112915
The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.
Int. Cl.³ C08F 210/06
U.S. Cl. 526—348.6 **3 Claims**

1. An ethylene/propylene/1-butene terpolymer characterized by containing 75.2 to 91.5 mol% propylene, 7.5 to 14.9 mol% ethylene and 1.0 to 9.9 mol% 1-butene, having a melting point based on DSC of 20° to 145° C., a haze value not larger than 40% when pressed to the thickness of 0.5 mm at 190° C. and measured according to JIS K 6714, a Shore C hardness based on JIS of 20 to 80 and a density of 0.86 to 0.91, and containing 0.01% to 5% by weight of boiling n-heptane insoluble portion.

4,415,719

THERMOPLASTIC, BRANCHED AROMATIC POLYPHOSPHONATES, AND A PROCESS FOR THEIR PRODUCTION

Manfred Schmidt, New Martinsville, W. Va.; Ludwig Bottenbruch; Dieter Freitag, both of Krefeld, Fed. Rep. of Germany; Klaus Reinking, Wermelskirchen, Fed. Rep. of Germany; Harry Röhr, Frechen, Fed. Rep. of Germany, and Hans-Dieter Block, Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 160,646, Jun. 18, 1980, Pat. No. 4,331,614. This application Dec. 7, 1981, Ser. No. 328,383
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925207
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.³ C08G 79/04
U.S. Cl. 528—167 **9 Claims**

1. A process for the production of a thermoplastic branched, aromatic polyphosphonate having a number average molecular weight of above 11,000 said process comprising transesterifying components (a) and (b) with (c) and (d) wherein component (a) is from 97 to 100 moles of at least one diaryl phosphonate and component (b) is up to 3 moles of at least one triaryl phosphate with the sum of the moles of (a) and (b) being 100, component (c) is from 90 to 99 moles of at least one aromatic dihydroxy compound and component (d) is up to 3 moles of at least one aromatic trihydroxy or tetrahydroxy compound with the proviso that at least one of the components (b) and (d) is present in a quantity of at least 0.001 mole and that the combined amount of (b) and (d) is at most 3 moles;

said transesterification being conducted in the melt at 90° C. to 340° C. in an oxygen-free atmosphere at atmospheric pressure or lower and in the presence of from 10^{-5} to 5×10^{-2} mole percent, based on 100 mole percent of aromatic dihydroxy compound, of at least one basic catalyst, with the volatile constituents produced in the course of transesterification being removed by distillation.

4,415,720

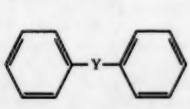
PRODUCTION OF AROMATIC POLYSULPHONES

John B. Rose, Letchworth, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 22, 1981, Ser. No. 304,556
Claims priority, application United Kingdom, Oct. 1, 1980, 8031595; Oct. 1, 1980, 8031596; Jan. 8, 1981, 8100400; Apr. 29, 1981, 8113228; Apr. 29, 1981, 8113229; May 15, 1981, 8114967
Int. Cl.³ C08G 75/23
U.S. Cl. 528—171 **17 Claims**

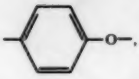
1. A process for the production of an aromatic polysulphone which comprises reacting under substantially anhydrous conditions in the presence of a fluoroalkane sulphonic acid the reactants selected from the following class:

(a) at least one aromatic compound of formula

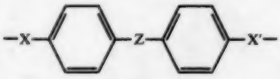


(i)

wherein —Y— is a direct link, —O—,



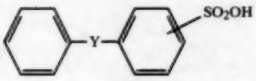
—CF_2—, —CR_1R_2— where R_1 and R_2 which may be the same or different are fully fluorinated alkyl radicals, or



where —X— and —X'— which may be the same or different are each a direct link, —O—, —CF_2—, or —CR_1R_2— where R_1 and R_2 are defined above, and —Z— is —CO—, —SO_2—, —CF_2—, or —CR_1R_2— where R_1 and R_2 are as defined above; or a nuclear-substituted derivative thereof in which any nuclear substituent does not deleteriously affect the polymerisation reaction or the properties of the polysulphone so produced and provided that the nuclear hydrogen atoms para to —Y— remain unsubstituted;

and a sulphonating agent;

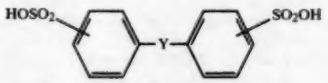
(b) at least one aryl monosulphonic acid of formula



(ii)

wherein —Y— is as defined in (a); or a nuclear-substituted derivative thereof in which any nuclear substituent does not deleteriously affect the polymerisation reaction or the properties of the polysulphone so produced and provided that in the benzene ring linked to —Y— not having the sulphonic acid group at least the nuclear hydrogen atom para to —Y— remains unsubstituted;

(c) at least one aryl disulphonic acid of formula



(iii)

wherein —Y— is as defined in (a); or a nuclear-substituted derivative thereof in which any nuclear substituent does not deleteriously affect the polymerisation reaction or the properties of the polysulphone so produced;

and at least one aromatic compound as defined in (a).

4,415,721

SEMI OR FULLY CONTINUOUS PROCESS FOR POLYESTER OF BISPHENOL AND DICARBOXYLIC ACID BY TRANSESTERIFICATION POLYMERIZATION AND PRODUCT THEREOF

George M. Kosanovich, Wilson, and Gideon Salee, Williamsville, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 198,979, Oct. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 128,742, Mar. 10, 1980, Pat. No. 4,319,017. This application Feb. 9, 1981, Ser. No. 232,929

Int. Cl.³ C08G *63/22*

U.S. Cl. 528—176 **47 Claims**

1. In the process of preparing a linear aromatic polyester by transesterification melt polymerization of monomer reactants consisting essentially of a bisphenol and a diaryl ester of a dicarboxylic acid in a polymerization reaction zone which comprises reacting said bisphenol and said diaryl ester in a first reaction stage of said zone to prepare a polyester oligomer, and thereafter continuing the reaction in a second reaction stage of said zone to produce the polyester product,

the improvement wherein the polymerization is carried out in the first reaction stage either batchwise or substantially continuously, and the polymerization is continued in the second reaction stage substantially continuously, with the provision that when the polymerization in the first reaction stage is carried out batchwise, the polymerization in the second stage comprises polymerization in a wiped film reaction zone followed by polymerization in a vented extrusion reaction zone.

4,415,722

BRANCHED AROMATIC POLYCARBONATE FROM ALIPHATIC POLYOL

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 19, 1982, Ser. No. 360,045

Int. Cl.³ C08G *63/62*

U.S. Cl. 528—196 **8 Claims**

1. A high molecular weight randomly branched polycarbonate of an aromatic dihydric phenol; a polyol in which the hydroxyl groups are attached to saturated aliphatic carbon atoms in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; and a carbonate precursor selected from the group consisting of a carbonyl halide and a haloformate.

4,415,723

RANDOMLY BRANCHED AROMATIC POLYCARBONATE FROM TRIPHENOL

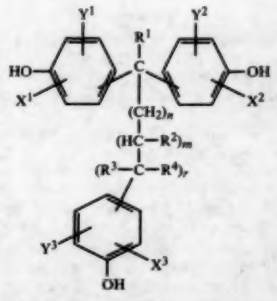
Charles V. Hedges, Mt. Vernon, and Victor Mark, Evansville, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 19, 1982, Ser. No. 359,987

Int. Cl.³ C08G *63/62*

U.S. Cl. 528—204 **4 Claims**

1. A composition comprising a high molecular weight, thermoplastic randomly branched polycarbonate derived from an aromatic dihydric phenol, a carbonate precursor, and a branching component in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; said randomly branched polycarbonate having an intrinsic viscosity of about 0–3 to 1.0 dl/g in methylene chloride at 25° C. wherein the branching component comprises one or more compounds of the formula



wherein X^1, X^2, X^3, Y^1, Y^2, and Y^3 are independently selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl of from 1 to 6 carbon atoms; R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen,

lower alkyl of from 1 to 6 carbon atoms; and n is an integer of 0, 1, 2, 3, 4, 5 and 6; m and r are integers of 0, 1 or 2 with the proviso that the sum of n+m+r is at least 1 and mixtures of said triphenolic compounds.

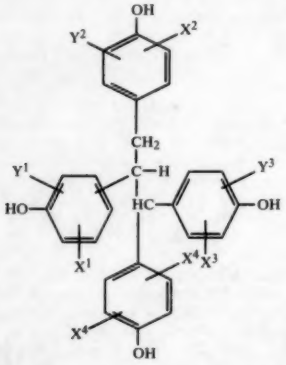
4,415,724

BRANCHED AROMATIC POLYCARBONATE FROM TETRAPHENOL

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 19, 1982, Ser. No. 360,042
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—204 **5 Claims**

1. A high molecular weight, thermoplastic, randomly branched polycarbonate derived from aromatic phenol; a branching component in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; and a carbonate precursor, said randomly branched polycarbonate having an intrinsic viscosity of about 0.3 to 1.0 dl/g in methylene chloride at 25° C., wherein the branching component comprises one or more tetraphenolic compounds of the formula:



wherein X^1, X^2, X^3, X^4, Y^1, Y^2, Y^3, and Y^4, are independently selected from hydrogen, chlorine, bromine, alkyl of from 1 to 6 carbon atoms or aryl.

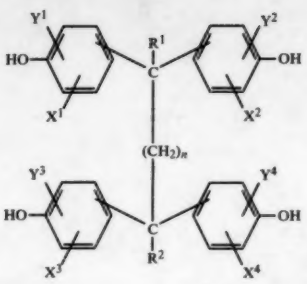
4,415,725

AROMATIC BRANCHED POLYCARBONATE FROM TETRAPHENOL

Charles V. Hedges, Mt. Vernon, and Victor Mark, Evansville, both of Ind., assignors to General Electric Co., Mt. Vernon, Ind.

Filed Mar. 19, 1982, Ser. No. 360,044
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—204 **4 Claims**

1. A high molecular weight, thermoplastic, randomly branched polycarbonate of: an aromatic dihydric phenol; a branching component in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking; and a carbonate precursor selected from the group consisting of a carbonyl halide, a haloformate and a diaryl carbonate, said randomly branched polycarbonate having an intrinsic viscosity of about 0.30 to 1.0 dl/g in methylene chloride at 25° C., wherein the branching component comprises one or more tetraphenolic compounds of the formula:



wherein X^1, X^2, X^3, X^4, Y^1, Y^2, Y^3 and Y^4 are independently selected from hydrogen, chlorine, bromine, alkyl of from 1 to 6 carbon atoms or aryl; n is an integer of 0, 1, 2, 3, 4, 5 or 6; and R^1 and R^2 are independently selected from hydrogen or alkyl of from 1 to 6 carbon atoms.

4,415,726

POLYESTER FIBER DYEABLE UNDER NORMAL PRESSURE AND PROCESS FOR THE PRODUCTION THEREOF

Hiroshi Tanji, Fuji; Michitaka Iwata, Minoo, and Hideo Sato, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 19, 1982, Ser. No. 340,895
Claims priority, application Japan, Jan. 19, 1981, 56-5131; Feb. 9, 1981, 56-16902
Int. Cl.³ C08G *63/02, 63/70*
U.S. Cl. 528—272 **6 Claims**

1. A fiber consisting essentially of polyethylene terephthalate capable of being dyed under normal pressure and having an initial modulus of more than about 50 g/d, a peak temperature (T max) at peak of dynamic mechanical loss tangent (tan δ) measured with a frequency of 110 Hz of about 85° C. to about 110° C., a peak value of the dynamic mechanical loss tangent ((tan δ) max) of about 0.115 to about 0.135, and a local average refractive index distributed symmetrically around the center of the cross section of the fiber.

4,415,727

MODIFIED POLYETHYLENE TEREPHTHALATE MOLDING MATERIAL

Yuzo Toga; Toshio Shimada, and Ichiro Okamoto, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 10, 1982, Ser. No. 416,746
Claims priority, application Japan, Sep. 11, 1981, 56-144214
Int. Cl.³ C08G *63/02, 63/70*
U.S. Cl. 528—272 **9 Claims**

1. A modified polyethylene terephthalate molding material containing terephthalic acid as a major dicarboxylic acid component and ethylene glycol as a major glycol component, which contains 0.1 to 15 mol %, based on the total amount of said glycol component present, of 2-methyl-1,3-propanediol as part of said glycol component.

4,415,728
ϵ-CAPROLACTONE CO-POLYESTERS USEFUL FOR THE PREPARATION OF POLYURETHANE

Meude Tremblay, Charlesbourg, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Feb. 25, 1980, Ser. No. 123,948
Int. Cl.³ C08G *63/14, 63/18, 63/34;* **C08L** *67/02*
U.S. Cl. 528—279 **10 Claims**

1. A process for the preparation of block or sequenced co-polyester diols of the structural formula I

$$H(OR_3COOR_4CO)_xOCH_2CH_2O[CO(CH_2)_5O]_yH \qquad I$$

which comprises simultaneously reacting ϵ-caprolactone in the presence of a catalyst with

(i) a diol of structural formula II

$$HO—R—OH \qquad II$$

as co-catalyst for the reaction wherein R is an alkyl group containing 1 to 8 carbon atoms or an alkyl group containing 1–12 carbon atoms having a nitrogen atom in its backbone; and

(ii) a di-carboxylic acid of structural formula III

$$HOOC(CH_2)_mCOOH \qquad III$$

wherein m is an integer from 1 to 36, R_3 is the residual structure of a diol of structural formula II, R_4 is the residual structure of a diacid of structural formula III, and x and y are integers of about 1–10.

4,415,729
RECOVERING GRANULAR POLY(ARYLENE SULFIDE) PARTICLES FROM A POLY(ARYLENE SULFIDE) REACTION MIXTURE

Lacey E. Scoggins, and Bradley L. Munro, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 4, 1982, Ser. No. 385,223
Int. Cl.³ C08G *75/14*
U.S. Cl. 528—388 **25 Claims**

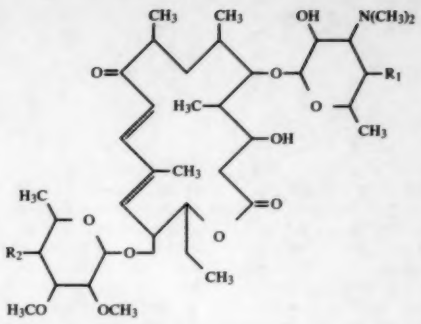
1. A method for recovery of granular poly(arylene sulfide) from a polymerization reaction mixture comprising polar organic solvent, poly(arylene sulfide) and alkali metal halide by-product said reaction mixture at a temperature above that at which poly(arylene sulfide) is in molten phase said method comprising, in the presence of a sufficient amount of a separation agent that is soluble in said polar organic solvent and is not a solvent for poly(arylene sulfide) to cause a phase separation of said molten poly(arylene sulfide) from said polar organic solvent, reducing the temperature of said polymerization reaction mixture sufficiently to produce from said polymerization reaction mixture a slurry comprising particulate poly(arylene sulfide) in polar organic solvent.

4,415,730
19-DEFORMYL-DEOXY-DESMYCOSIN

Tatsuro Fujiwara, Shizuoka; Eiichi Honda; Hideo Sakakibara, both of Mishima, and Takao Hirano, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 23, 1982, Ser. No. 391,284
Claims priority, application Japan, Jun. 23, 1981, 56-98105; Dec. 28, 1981, 56-211648
Int. Cl.³ A61K *31/71;* **C07H** *17/08*
U.S. Cl. 536—7.1 **4 Claims**

1. A compound of the formula



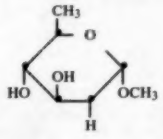
wherein R_1 and R_2 are hydrogen or hydroxyl and at least one of R_1 and R_2 is hydrogen, or a pharmaceutically acceptable salt thereof.

4,415,731
PROCESS FOR THE PREPARATION OF METHYL 2,6-DIDEOXY-α-D-ARABINO-HEXOPYRANOSIDE

Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

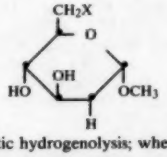
Filed Mar. 30, 1981, Ser. No. 248,175
Int. Cl.³ C07H *5/02, 1/00*
U.S. Cl. 536—18.4 **2 Claims**

1. A process for preparing methyl 2,6-dideoxy-α-D-arabino-hexopyranoside of the structure:



comprising the steps of:

iodinating with an iodinating agent selected from: methyltriphenoxyphosphonium iodide; iodotriphenoxyphosphonium iodide, triphenylphosphine-N-iodo-succinimide; triphenylphosphine-tetraiodomethane; triphenylphosphine-2,4,5-triiodoimidazole; triphenylphosphine, iodine, and imidazole the substrate methyl 2-deoxy-α-D-glucopyranoside wherein hydroxyl groups are unprotected to yield:



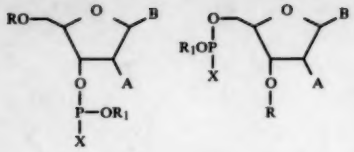
followed by catalytic hydrogenolysis; wherein X is iodo.

4,415,732
PHOSPHORAMIDITE COMPOUNDS AND PROCESSES

Marvin H. Caruthers, and Serge L. Beaucage, both of Boulder, Colo., assignors to University Patents, Inc., Norwalk, Conn.

Filed Mar. 27, 1981, Ser. No. 248,450
Int. Cl.³ C07H *17/00*
U.S. Cl. 536—27 **20 Claims**

1. A compound represented by one of the formulae:



wherein B is a nucleoside or deoxynucleoside base; A is H, OH or OR_2 in which R_2 is a blocking group; R is a blocking group; R_1 is a hydrocarbyl radical containing up to about 10 carbon atoms; and X is NR_2R_3, wherein R_2 and R_3 taken separately each represent alkyl, aryl, aralkyl, cycloalkyl and cycloalkylalkyl containing up to 10 carbon atoms; R_2 and R_3 when taken together form an alkylene chain containing up to 5 carbon atoms in the principal chain and a total of up to 10 carbon atoms with both terminal valence bonds of said chain being attached to the nitrogen atom to which R_2 and R_3 are attached; and R_2 and R_3 when taken together with the nitrogen atom to which they are attached form a saturated nitrogen heterocycle including at least one additional heteroatom from the group consisting of nitrogen, oxygen and sulfur.

4,415,733

GANGLIOSIDE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION

Jean-Louis Tayot, Lyon la Ducherie, France, assignor to Societe Anonyme dite: Institut Merieux, Lyons, France

Filed Mar. 16, 1981, Ser. No. 244,312
Claims priority, application France, Mar. 17, 1980, 80 05891
Int. Cl.³ C08B *37/00*
U.S. Cl. 536—53 **7 Claims**

1. A partially deacylated derivative of a ganglioside or glycolipid having an N-acyl group and being selected from G_{D1a}, G_{D1b} and G_{T1} gangliosides, said derivative exhibiting specific affinity properties when coupled to a solid support, wherein said derivative exhibits free amino groups that can be brought out by a positive reaction in the ninhydrin test, wherein also said derivative is mobile in chromatography on a thin silica gel layer in a 60:32:7 chloroform-methanol-water system, and wherein said derivative exhibits the specific affinity properties of the ganglioside or glycolipid from which it is derived, said derivative being capable of being coupled to a solid support by amino groups that have appeared during partial deacylation, without loss of said specific affinity properties.

4,415,734

PROCESS FOR PREPARATION OF CELLULOSE ACETATE

Hideo Yabune, and Manabu Uchida, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,334
Claims priority, application Japan, Jul. 10, 1981, 56-108672
Int. Cl.³ C08B *3/06, 3/24*
U.S. Cl. 536—76 **7 Claims**

1. In a process for preparing cellulose acetate by acetylating a cellulosic raw material to produce primary cellulose acetate and then converting the same to secondary cellulose acetate, the improvement wherein the cellulose material is acetylated to produce the primary cellulose acetate and then the primary cellulose acetate is converted to the secondary cellulose acetate by alcoholysis using a lower aliphatic alcohol without separating the cellulose triacetate from the acetylation system, the alcoholysis system also containing acetic acid from the acetylating step.

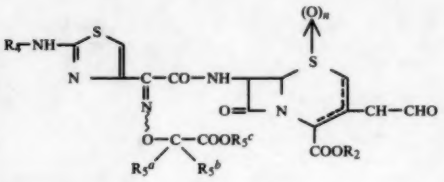
4,415,735

3-FORMYLMETHYL-CEPHALOSPORINS

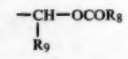
Daniel Farge; Pierre L. Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 19, 1981, Ser. No. 322,963
Claims priority, application France, Nov. 20, 1980, 80 24636
Int. Cl.³ C07D *501/26*
U.S. Cl. 544—22 **4 Claims**

1. A cephalosporin of the formula:



in the syn or anti form, in which formula n is 0 or 1, the radicals $R_5{}^a$ and $R_5{}^b$, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms, $R_5{}^c$ represents a hydrogen atom or an acid-protecting radical selected from the group consisting of methoxymethyl, t-butyl, benzhydryl, benzyl, nitrobenzyl and p-methoxybenzyl, R_4 represents an amine-protecting radical selected from the group consisting of t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, formyl, chloroacetyl, trichloroacetyl, trifluoroacetyl, trityl, benzyl, dibenzyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, and p-methoxybenzyloxycarbonyl and the symbol R_2 represents a radical which can easily be removed by an enzymatic method, of the formula:



(in which R_8 represents an alkyl radical or the cyclohexyl radical and R_9 represents a hydrogen atom or an alkyl radical), or an acid-protecting radical selected from the group consisting of methoxymethyl, t-butyl, benzhydryl, benzyl, nitrobenzyl and p-methoxybenzyl, the above-mentioned alkyl portions or radicals being linear or branched and containing 1 to 4 carbon atoms, and the compound being in the form of 3-oxoethyl-bicyclooct-2-ene or -bicyclooct-3-ene or a 3-oxoethylidenbicyclooctane, or a mixture thereof, if n=0, and in the form of a 3-oxoethylbicyclooct-2-ene or a 3-oxoethylidenebicyclooctane, or a mixture thereof, if n=1, and mixtures of the isomers in which the carboxyalkoxyimino group of the 7-acylamino radical is located in the syn or anti position.

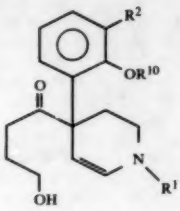
4,415,736

CERTAIN TETRAHYDROPYRIDINE INTERMEDIATES

Engelbert Ciganek, Kennett Square, Pa., and Ashokkumar B. Shenvi, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

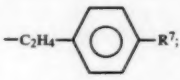
Filed Dec. 28, 1981, Ser. No. 334,838
Int. Cl.³ C07D *405/04, 213/50*
U.S. Cl. 546—283 **1 Claim**

1. A tetrahydropyridine compound having the following formula:



wherein

R^1 is C_{1-10} alkyl, $-CH_2R^6$ or



R_2 is —H or C_{1-12} alkoxy;

R^6 is C_{3-6} cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group;

R^7 is —H or C_{1-3} alkyl; and

R^{10} Is C_{1-10} alkyl.

4,415,737

THIAZOLIDINE-SUBSTITUTED PHENYL SULFONAMIDES

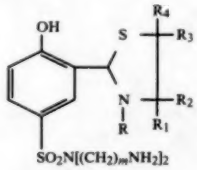
Stephen R. Herchen, Duxbury, and David Messersmith, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 20, 1982, Ser. No. 451,349

Int. Cl.³ C07D *277/04*

U.S. Cl. 548—146 **5 Claims**

1. A compound of the formula



wherein R is selected from alkyl, aryl, aralkyl and alkaryl; R_1, R_2, R_3, R_4 each are selected from hydrogen, alkyl, aryl, aralkyl and alkaryl; and m is 2 to 10.

4,415,738

PROCESS FOR THE PRODUCTION THIAZOLINES-(3)

Jürgen Martens, Alzenau; Paul Scherberich, Constance; Horst Bethge, and Axel Kleemann, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

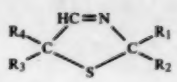
Filed Jul. 9, 1981, Ser. No. 281,858

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026334

Int. Cl.³ C07D *277/08*

U.S. Cl. 548—147 **13 Claims**

1. In a process for preparing a thiazoline-(3) compound of the formula



(I)

in which R_1, R_2, R_3, and R_4 individually are hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, or aralkyl or R_1 and R_2 are joined together or R_3 and R_4 are joined together and form which the carbon atom or atoms of the thiazoline ring to which they are connected a ring by reacting (1) an oxo compound of the formula

(II)

(2) a metal or ammonium hydrogen sulfide, (3) ammonia and (4) an oxo compound having a halogen atom on the carbon atom adjacent to the carbonyl group and having the formula

(III)

where X is chlorine or bromine, the improvement comprising having reactants (1), (2), and (3) present as a mixture and adding reactant (4) to said mixture.

4,415,739

PROCESS FOR PRODUCING 4-BENZOYLPYRAZOLES

Takahiro Haga, Kusatsu; Tetsuji Nishikawa, Moriyama; Toshio Nakajima, Kusatsu; Kohji Minamida, Shiga, and Masaru Maeda, Hikone, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

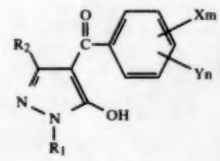
Filed Jul. 20, 1982, Ser. No. 400,025

Claims priority, application Japan, Aug. 3, 1981, 56-121691; Jun. 11, 1982, 57-100434

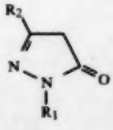
Int. Cl.³ C07D *23/20*

U.S. Cl. 548—367 **10 Claims**

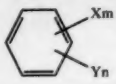
1. A process for producing a 4-benzoyl-5-hydroxypyrazole represented by the formula (I):



wherein R_1 is a hydrogen atom or an alkyl group, R_2 is an alkyl group, X is a halogen atom, Y is an alkyl group, m is an integer of 1 to 5, n is an integer of 0 to 2 with the proviso that m is not less than n, or basic salts formed by the hydroxy group of the pyrazoles which comprises a condensation reaction of a pyrazolone represented by the formula II:



wherein R_1 and R_2 are as defined above, tetrachloromethane and a benzene compound represented by the formula III:



wherein X, Y, m and n are as defined above, in the presence of an aluminum halide at a temperature of 0° C. to 100° C., followed by a hydrolysis reaction at a temperature of 0° C. to 150° C.

4,415,740

METHOD FOR PREPARING A LACTONE REACTION PRODUCT

Benjamin J. Kaufman, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 14, 1982, Ser. No. 387,995
Int. Cl.³ C07D *309/30, 307/32*
U.S. Cl. 549—273 **3 Claims**

1. A process for preparing an alkenyl-substituted lactone reaction product in which the employed catalyst initiates the reaction, and at the end thereof, is substantially removed from the product, which comprises the steps of admixing an alkenyl succinic acid, said alkenyl radical having an average molecular weight ranging from about 300 to 3000, with an alpha carbon halogen substituted acetic acid having from 1 to 3 halogen substituents and a pKa of less than 3, to form a substantially anhydrous reaction mixture and reacting said mixture at an elevated temperature up to about 100° C. until infrared spectra at about 5.66 and 5.78 microns indicates a substantial conversion of said alkenyl-succinic acid to said lactone reaction product, and heating the reaction product further at a temperature of from 95° C. to about 105° C. for about 1 to 5 hours to distill off the alpha carbon halogen substituted acetic acid from the reaction product to leave remaining an alkenyl-substituted lactone reaction product that is substantially free of halogen substituted acetic acid.

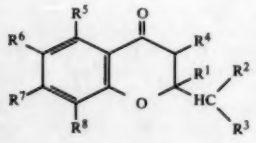
4,415,741

CHROMAN-4-ONES AND PROCESS FOR PREPARING SAME

Hans-Joachim Kabbe, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 853,932, Nov. 22, 1977, abandoned, which is a continuation of Ser. No. 706,098, Jul. 16, 1976, abandoned. This application Jan. 7, 1982, Ser. No. 337,802
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535338; Mar. 20, 1976, 2611910
Int. Cl.³ C07D *311/22*
U.S. Cl. 549—345 **11 Claims**

1. Process for preparing a chroman-4-one of the formula

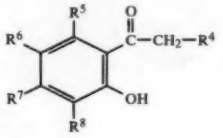


wherein

R^1 to R^3 are identical or different and represent hydrogen, alkyl having up to 18 cabon atoms, alkenyl having up to 18 carbon atoms, cycloalkyl having 3 to 18 carbon atoms, cycloalkenyl having 3 to 18 carbon atoms, aryl having 6 to 14 carbon atoms, aralkyl having 7 to 18 carbon atoms with 1 to 8 carbon atoms in the aliphatic part, alkoxycarbonyl having up to 4 carbon atoms in the alkyl part of carboxyl or C_2 to C_6 carboxyalkyl,

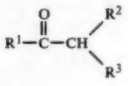
R^1 and R^2 can be closed to form a 3-membered to 12-membered carbocyclic ring or a 5- to 12-membered heterocyclic ring in which the hetero atoms are nitrogen, oxygen or sulfur, R^4 represents hydrogen,

R^5 to R^8 are identical or different and represent hydrogen, halogen, hydroxyl, nitro, cyano, carboxyl, alkyl having up to 18 carbon atoms, cycloalkyl having 3 to 18 carbon atoms, aryl having 6 to 14 carbon atoms, aralkyl having 7 to 18 carbon atoms with 1 to 8 carbon atoms in the aliphatic part, alkoxy having up to 4 carbon atoms, aralkoxy having 7 to 10 carbon atoms, aryloxy having 6 to 10 carbon atoms, alkoxycarbonyl having up to 4 carbon atoms in the alkyl part, and acylamino having up to 18 carbon atoms, and wherein each of said alkyl, cycloalkyl, aryl, aralkyl, alkoxy, aralkoxy or alkoxycarbonyl is substituted by substituents which are inert under the reaction conditions, which comprises reacting an o-hydroxy-arylcarbonyl compound of the formula



wherein

R^4 to R^8 have the above-mentioned meaning, with carbonyl compound of the formula



wherein

R^1 and R^3 have the above-mentioned meaning, in the presence of an amine of the formula

$$R^9—NH—R^{10}$$

wherein

R^9 and R^{10} represent alkyl groups having up to 18 carbon atoms which, together with the N atom, can be linked to form a heterocyclic ring having 5 to 6 ring members.

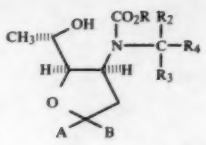
4,415,742

TETRAHYDRO-5-(1-HYDROXYETHYL)-2-HYDROXY-N(1-ARYLHYDROCARBYL)FURAN-4-CARBAMIC ACID ALKYL ESTERS

Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 326,731, Dec. 2, 1981, Pat. No. 4,376,207, which is a division of Ser. No. 179,126, Aug. 18, 1980, Pat. No. 4,324,726, which is a division of Ser. No. 60,261, Jul. 25, 1979, Pat. No. 4,252,964. This application Sep. 27, 1982, Ser. No. 423,927
Int. Cl.³ C07D *307/22*
U.S. Cl. 549—475 **2 Claims**

1. A compound of the formula:



wherein A is OH; B is hydrogen; R is lower alkyl; R_2 and R_4 are hydrogen, aryl, aralkyl, or lower alkyl and R_3 is aryl, or enatiomeric or racemic mixtures thereof.

4,415,743

FURANYL OXIMES

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

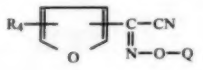
Division of Ser. No. 144,157, Apr. 28, 1980, which is a continuation of Ser. No. 939,096, Sep. 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 881,953, Feb. 27, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 430,073

Claims priority, application Switzerland, Mar. 2, 1977, 2606/77; Feb. 7, 1978, 1348/78

Int. Cl.³ C07D *307/52*

U.S. Cl. 549—491 **3 Claims**

1. A compound of the formula



wherein

R_4 is hydrogen, chlorine, nitro or methyl, and

Q is C_1–C_4 alkyl, C_1–C_4 alkyl interrupted by oxygen, C_1–C_4 alkyl substituted by cyano, allyl, propynyl, C_1–C_4 alkanecarboxylic acid ester in which the ester moiety has from 1 to 4 carbon atoms, or C_1–C_4 alkanecarboxylic acid amide.

4,415,744

VAPOR PHASE NITRATION OF AROMATIC COMPOUNDS

Ignatius Schumacher, Ballwin, and Kang-Bo Wang, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 21, 1981, Ser. No. 313,522

Int. Cl.³ C07C *79/46*

U.S. Cl. 560—20 **45 Claims**

1. In a process for the vapor phase nitration of aromatic compounds where the aromatic compound is contacted with a nitrating agent in the vapor phase to yield the corresponding nitroaromatic compound, the improvement comprising conducting the nitration in the presence of a nitration promoting catalyst which comprises the adduct of:

(a) an alumina-silica-metal oxide combination represented by the formula:

$$(Al_2O_3)_a(SiO_2)_b(M_{2/n}O)_c$$

wherein M is a metal cation selected from the group consisting of the lanthanides of rare earths, Groups 1b, 2b, 5b, 6b, 7b, and 8 of the Periodic Table of the Elements, and mixtures thereof, and a, b, and c represent weight percent of the Al_2O_3, SiO_2, and $M_{2/n}O$ components, respectively, in the alumina-silica-metal oxide combination, with a being 0 to 100, b being 0 to 100, and c being 0 to 50, and n represents an integer from 1 to 7 of the valence of the metal cation, with the proviso that the sum of (a+b) must be greater than 0, and

(b) a catalytically effective amount of sulfur trioxide.

4,415,745

PROCESS FOR THE PREPARATION OF AROMATIC CARBAMATES AND ISOCYANATES

Ji-Yong Ryu, Ramsey, and Arthur M. Brownstein, Wycoff, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 290,005, Aug. 4, 1981, which is a continuation of Ser. No. 179,062, Aug. 18, 1980, abandoned. This application Jan. 28, 1982, Ser. No. 343,583

Int. Cl.³ C07C *125/06, 118/00*

U.S. Cl. 560—25 **8 Claims**

1. A process for making an aromatic polycarbamate which comprises:

(a) reacting at least one compound represented by the structural formula:

$$(Ar)\text{—}(R_1)_n \qquad (I)$$

wherein Ar is a halogen substituted or unsubstituted aromatic hydrocarbyl group, R_1 is an alkyl group having from about 1 to about 10 carbons, and n is a number which can vary from 1 to about 5; with ammonia and oxygen under conditions and in a manner sufficient to form at least one aromatic nitrile containing compound represented by the structural formula:

$$(Ar')\text{—}(CN)_n \qquad (Ia)$$

wherein Ar' is a substituted or unsubstituted aromatic hydrocarbyl group having from about 6 to about 14 carbons exclusive of substituents; said substituents on Ar' being selected from the group consisting of halogen, alkyl having from about 1 to about 10 carbons, and mixtures thereof; and n is as described in connection with structural formula I;

(b) hydrolyzing said aromatic nitrile containing compound in a manner and under conditions sufficient to form at least one amide represented by the structural formula:

$$(Ar')\text{—}(CONH_2)_n \qquad (II)$$

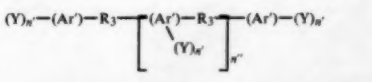
wherein Ar' and n are as described in connection with structural formula Ia above;

(c) converting at least one of said amide groups present on the compound of structural formula II to a carbamate group in a manner and under conditions sufficient to form at least one carbamate compound represented by the structural formula:

$$(Ar')\text{—}(NHCO_2R_2)_n \qquad (III)$$

wherein R_2 represents a hydrocarbyl group independently selected from alkyl having from about 1 to about 10 carbons, aryl having from about 6 to about 14 carbons, alkaryl and aralkyl wherein the alkyl and aryl groups thereof are as described immediately above, and cycloalkyl having from about 4 to about 10 carbons; and Ar' and n are as described in connection with structural formula Ia; and

(d) condensing the carbamate with a carbonyl containing compound in a manner and under conditions sufficient to form at least one aromatic polycarbamate represented by the structural formula:



(IV)

wherein: Y represents the group —$NHCO_2R_2$, R_2 being as described above; R_3 is a hydrocarbyl group independently selected from alkylene having from about 1 to about 10 carbons, arylene having from 6 to about 14 carbons, aralkylene and alkarylene wherein the alkyl and aryl portions thereof are as described above, and cycloalkylene

having from about 4 to about 10 carbons; n' is a number which can vary from about 1 to about 4; n'' is a number which can vary from about 0 to about 5; and Ar' is as described in connection with structural formula III.

4,415,746

16-ARYLOXY-17,18,19,20-TETRANORPROSTANOIC ACIDS AND DERIVATIVES

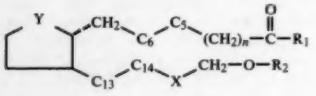
Charles V. Grudzinskas, Garnerville, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 748,976, Dec. 9, 1976. This application Oct. 5, 1981, Ser. No. 308,658

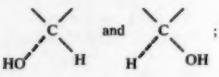
Int. Cl.³ C07C *177/00*

U.S. Cl. 560—61 **57 Claims**

1. A compound selected from the group consisting of an optically active compound of the formula:



and a racemic compound of that formula and the mirror image thereof; wherein R_1 is hydroxy or alkoxy having from 1 to 12 carbon atoms; R_2 is phenyl, naphthyl, 5,6,7,8-tetrahydronaphthyl, or 5,6,7,8-tetrahydronaphthyl substituted with one or two groups selected from the group consisting of halogen, lower alkyl, lower alkoxy and n is an integer from 2 to 4, inclusive; X is a divalent moiety selected from the group consisting of those of the formulae:



Y is a divalent moiety of the formulae:

the moiety of $-C_5-C_6-$ is ethylene or cis-vinylene and the moiety $-C_{13}-C_{14}-$ is ethylene or trans-vinylene with the proviso that when $-C_5-C_6-$ is cis-vinylene then $-C_{13}-C_{14}-$ must be trans-vinylene; and the non-toxic cationic salts thereof when R_1 is hydroxy.

4,415,747

PROCESS FOR MAKING ETHYLENE GLYCOL DERIVATIVES

Leonard Kaplan, Dunbar, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 29, 1981, Ser. No. 307,074

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—112 **18 Claims**

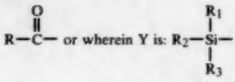
1. The process for making ethylene glycol derivatives of the formula (I):

(I)

comprising reacting an α-halo compound of the formula (II):

(II)

wherein the substituent Y is R— or



wherein R, R_1, R_2 and R_3 may each be a monovalent hydrocarbon of 1 to about 30 carbon atoms, and X is at least one of Cl, Br and I, by reacting said α-halo compound in the presence of an iron compound having iron in the zero oxidation state at a temperature and pressure sufficient to form such ethylene glycol derivatives.

4,415,748

INTERMEDIATES FOR INSECTICIDAL SYNTHETIC PYRETHROIDS

William G. Scharpf, Yardley, and Michael S. Glenn, Langhorne, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 6, 1981, Ser. No. 290,557

Int. Cl.³ C07C *69/63*

U.S. Cl. 560—227 **1 Claim**

1. The compound of the formula

4,415,749

CATALYTIC PROCESS FOR THE SELECTIVE FORMATION OF ETHANOL AND METHYL ACETATE FROM METHANOL AND SYNTHESIS GAS

Duane C. Hargis, Pleasant Ridge, and Michael Dubeck, Birmingham, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 153,610, May 27, 1980, Pat. No. 4,309,314. This application Sep. 15, 1981, Ser. No. 302,583

Int. Cl.³ C07C *67/36, 69/14, 29/00, 31/08*

U.S. Cl. 560—232 **6 Claims**

1. A process for selectively producing ethanol and methyl acetate which comprises reacting methanol with carbon monoxide and hydrogen in the presence of a heterogeneous catalyst comprising rhodium and iron each in the zero valent state deposited on a support of alumina impregnated with a minor amount of an alkaline metal selected from the alkaline metals of Groups I and II of the Periodic Table at reaction conditions of about 225° C. to about 300° C. and pressure within the range of from about 50 psig to about 250 psig.

4,415,750

PROCESS FOR SEPARATION OF 2-HYDROXYNAPTHALENE-3-CARBOXYLIC ACID FROM THE REACTION MIXTURES OF ALKALI METAL SALTS OF 2-HYDROXYNAPHTHALENE AND CARBON DIOXIDE

Heinrich Volk, Bad Vilbel, and Theodor Papenfahs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 264,826, May 18, 1981, abandoned, which is a continuation of Ser. No. 131,680, Mar. 19, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,314

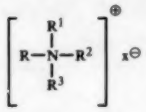
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911667

Int. Cl.³ C07C *51/43*

U.S. Cl. 562—467 **5 Claims**

1. In a process for the separation and isolating of 2-hydroxynaphthalene-3-carboxylic acid from the reaction product of the sodium salt of 2-hydroxynaphthalene and carbon dioxide, which comprises

(a) diluting the resulting carboxylation melt with water and dissolving it,
(b) adjusting the pH of the solution to a value of about 3.5 to 7 and separating undissolved or precipitated products, and
(c) recovering and separating 2-hydroxynapthalene-3-carboxylic acid by acidic precipitation and isolating it, the improvement comprises precipitating the alkali-soluble acid resins from the solution of the carboxylation melt by means of a cationic compound added to the solution between steps (b) and (c), said compound corresponding to the formula



in which R, R^1, R^2 and R^3 are identical or different from each other and each is an unsubstituted or substituted aliphatic radical, an aralkyl or aryl radical, or two or three of the aliphatic radicals form together with the nitrogen atom a heterocyclic ring selected from the group of pyridine, morpholine, imidazoline, benzimidazoline, imidazole, benzimidazole and oxazole, with the proviso that the sum of the carbon atoms of the substituents R through R^3 are at least 8, and in which $x^{\ominus}$ is the equivalent of an inorganic or organic acid.

4,415,751

PROCESS FOR PREPARING PHENYLALKANOIC ACIDS

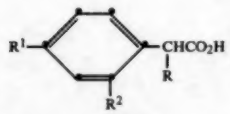
James M. Greene, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 248,379, Mar. 27, 1981, abandoned. This application Mar. 24, 1982, Ser. No. 361,293

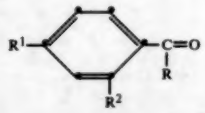
Int. Cl.³ C07C *65/01*

U.S. Cl. 562—478 **37 Claims**

1. A process for preparing an acid of the formula



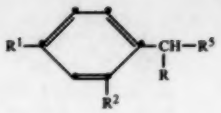
wherein R is hydrogen or C_1–C_3 alkyl; one of R^1 and R^2 is hydrogen and the other is hydroxy; provided that R is hydrogen or methyl when R^2 is hydroxy; comprising catalytically hydrogenating a compound of the formula



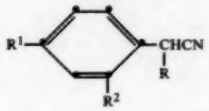
in the presence of an inert organic solvent, and optionally in the presence of an amine of the formula

HNR^3R^4

wherein R^3 is C_1–C_3 alkyl and R^4 is hydrogen or C_1–C_3 alkyl, to prepare a compound of the formula



wherein R^5 is $—NR^3R^4$ if an amine is present, and is —OH if an amine is not present; adding an alkali metal cyanide to the mixture;
holding the mixture at from about 100° to about 150° until a compound of the formula



is formed; removing the solvent; adding aqueous alkali metal hydroxide; holding the mixture at about 75°–125° until the product is formed; making the mixture acid; cooling the mixture; extracting the mixture with an inert organic solvent; and isolating the acid from the organic solvent.

4,415,752

PROCESS FOR PREPARING UNSATURATED ACIDS WITH MO, V, NB, FE-CONTAINING CATALYSTS

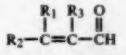
Harry J. Decker, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 827,674, Aug. 25, 1977, abandoned, which is a continuation of Ser. No. 621,088, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,780, Sep. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 408,419, Oct. 23, 1973, abandoned. This application Apr. 22, 1980, Ser. No. 142,706

Int. Cl.³ C07C *51/25, 57/055*

U.S. Cl. 562—534 **7 Claims**

1. A process for the production of an unsaturated aliphatic carboxylic acid by the vapor phase catalytic oxidation with molecular oxygen of the corresponding unsaturated aliphatic aldehyde having the structure:



wherein R_1 is hydrogen or a C_1 to C_6 alkyl radical and R_2 and R_3 are the same or different and are H or CH_3, which comprises contacting said molecular oxygen and unsaturated aldehyde in the presence of steam with an oxidation catalyst consisting essentially of the elements Mo, V, Nb, Fe and X, in combination with oxygen and having the empirical formula:

$$Mo_aV_bNb_cFe_dX_e$$

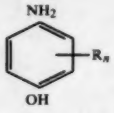
wherein
X is selected from the group consisting of Cr and Mn,
a is 12,
b is 1 to 14,
c is 0.1 to 12,
d is a number greater than 0 and up to 3,
e is 0 to 3 with the proviso that d+e is 3 or less; said catalyst having been prepared by drying an aqueous slurry or solution of salts of said elements followed by calcination.

4,415,753
PROCESS FOR PREPARING P-AMINOPHENOL AND ALKYL SUBSTITUTED P-AMINOPHENOL

Douglas C. Caskey, O'Fallon, and Douglas W. Chapman, St. Louis, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

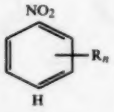
Filed Jan. 29, 1982, Ser. No. 343,993
Int. Cl.³ C07C *85/11, 89/00*
U.S. Cl. 564—418 **18 Claims**

1. A process for production of substituted or unsubstituted p-aminophenol having the formula



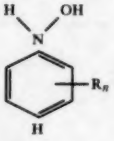
where R is lower alkyl and n is 0, 1 or 2, the process comprising the steps of:

preparing a charge mixture comprising a substrate selected from the group consisting of substituted and unsubstituted nitrobenzenes having the formula



where R and n are as defined above, a catalyst containing platinum, and a sulfur compound selected from the group consisting of divalent sulfur compounds in which sulfur is bonded to two other moieties and compounds reducible to such divalent sulfur compounds under catalytic hydrogenation conditions;

introducing hydrogen into said mixture while agitating the mixture at a temperature in the range of between about 0° and about 40° C., thereby reducing said substrate to a hydroxylamine having the formula



where R and n are as defined above; and

thereafter heating said hydroxylamine to a temperature of at least about 70° C. and agitating it at at least about 70° C. in the presence of a highly dissociated acid, thereby effecting rearrangement of said hydroxylamine to the corresponding p-aminophenol.

4,415,754
PROCESS FOR PREPARING ANILINE

Frederick R. Lawrence, Claymont, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 17, 1983, Ser. No. 458,659
Int. Cl.³ C07C *85/11*
U.S. Cl. 564—423 **6 Claims**

1. A method for preparing aniline directly from acidic nitrobenzene containing about 10–30,000 ppm of polynitrophenol impurities, the method comprising

(a) removing substantially all the mineral acid from the nitrobenzene,

(b) catalytically hydrogenating the nitrobenzene resulting from step (a) to give aniline and tars, and then

(c) separating the aniline and the tars.

4,415,755
NITRILES AND PRIMARY AMINES FROM PRIMARY ALCOHOLS

John M. Larkin, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 10, 1981, Ser. No. 319,846
Int. Cl.³ C07C *85/06, 120/00*
U.S. Cl. 564—480 **8 Claims**

1. A method for the continuous production of nitriles and primary amines from primary alcohols by means of reductive amination comprising

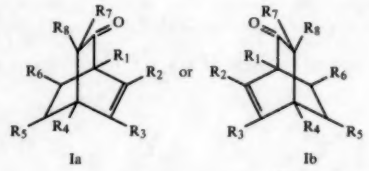
reacting a primary alcohol having no amine substituents in the beta position, with ammonia and hydrogen, all in the vapor phase, in the presence of a copper chromite catalyst.

4,415,756
PURE ENANTIOMERS OF BICYCLO[2.2.2]OCT-5-EN-2-ONES, PROCESSES FOR THEIR PRODUCTION AND THEIR USE

Martin Demuth, and Kurt Schaffner, both of Mülheim, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,644
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046106
Int. Cl.³ C07C *45/00*
U.S. Cl. 568—365 **8 Claims**

1. A process for the preparation of a pure enantiomer of one of the formulae below



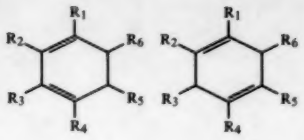
Ia Ib

wherein

R_1, R_2, R_3, R_4, R_5 and R_6 may be H, C_1 to C_8 alkyl, C_1 to C_8 alkoxy, hydroxylated and/or carbonylated C_1 to C_8 alkyl groups which can contain one or more double and/or triple bonds and may also be —C≡N or —COOH and/or an ester thereof or

wherein R may be H, C_1 to C_8 alkyl, C_1 to C_8 alkoxy and a hydroxylated and/or carbonylated C_1 to C_8 alkyl group which can contain one or more double bonds and/or triple bonds and, moreover, the carbonyl group can be acetalized or ketalized, and

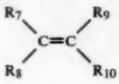
R_7 and R_8 may be H, C_1 to C_8 alkyl, C_1 to C_8 alkoxy and hydroxylated and/or carbonylated C_1 to C_8 alkyl groups which can contain one or more double bonds and/or triple bonds by effecting a Diels-Alder addition of a cyclohexadiene of the formula II or III below



II III

wherein

R_1–R_6 inclusive have the above-mentioned meanings with an ene of the formula



IV

wherein

R_7 and R_8 are as defined above and

R_9 and R_{10} are hydrolyzable substituents which are hydrolyzed under ketalization conditions, the racemates of the bicyclo[2.2.2]oct-5-ene-2-ones obtained by Diels-Alder addition are either completely ketalized with pure enantiomers of diols selected from the group consisting of 1, 3-diols; 2, 4 diols and vicinal diols and the ketals are separated by chromatography or, in the case of only partial ketalization, the enantomeric bicyclo [2.2.2] oct-5-ene-2-one which has not been or has been less ketalized is separated from the ketalized enantiomer(s) by distillation and/or chromotography and the latter is also separated by chromotography.

4,415,757

PRODUCTION OF SATURATED CARBONYL COMPOUNDS

David R. Pyke, Clwyd, Wales, and Robert Reid, Warrington, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 15, 1982, Ser. No. 358,103

Claims priority, application United Kingdom, Mar. 19, 1981, 8108709

Int. Cl.³ C07C *45/32*

U.S. Cl. 568—475 **8 Claims**

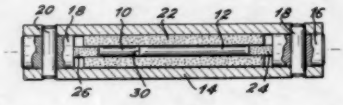
1. A process for the production of a saturated carbonyl compound having 2 to 4 carbon atoms which comprises bringing into reaction at a temperature in the range of 250° to 475° C. in the gas phase an alkane having 2 to 4 carbon atoms with molecular oxygen and hydrogen chloride in the presence of a solid particulate catalyst composition comprising (1) metallic silver and/or an oxide, chloride or oxychloride thereof and (2) an oxide, chloride or oxychloride of at least one other metal, selected from manganese, cobalt, iron, nickel and the platinum group metals.

4,415,758

PROCESS FOR MAKING A JOINT BETWEEN TWO METAL WIRES AND A DIFFERENTIAL THERMOCOUPLE

Jean-Andre Lacoste, Paris; Jean-Pierre Leveque, Gif-sur-Yvette, and Robert Schley, Orly, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 4, 1980, Ser. No. 203,948
Claims priority, application France, Nov. 7, 1979, 79 27454
Int. Cl.³ H01L 35/02
U.S. Cl. 136—233 8 Claims



1. A process for producing a joint between a first metal wire and a second metal wire, the joint having a length less than 10 microns, comprising the steps of forming a stack from a first metal wire and a second metal wire placed end to end and having an interface, placing the stack in a tube sealed at its two ends and made from a material whose thermal expansion coefficient is well below that of the metals forming the two wires, placing spacers made from a ceramic material between the tube and the stack in such a way that the free end of each wire is immobilised with respect to one of the ends of the tube and heating this assembly at a temperature less than the melting temperatures of the metals of which said first and second wires are made so that a diffusion weld is obtained at the contacting ends of the wires under substantially high pressure caused by the action of the difference in the elongations of the tube and the wires.

8. A process for producing a differential thermocouple, wherein a weld is produced by diffusion between one end of a first wire made from an alloy comprised of 64–89% nickel, 0–25% iron, and 10–20% chromium, and one end of a second wire from an alloy comprised of 94% nickel, 2.5% manganese, 2% aluminum, 1% silicon, and 0.5% iron, comprising the steps of formulating an assembly by embedding the wire, provided with the weld, and another wire made from either of said alloys in an insulating ceramic material surrounded by a sheath and subjecting said assembly to a drawing operation to give said assembly a suitable final external diameter for use as a differential thermocouple, said process including the steps of producing said diffusion weld comprising forming a stack from said first and second metal wires placed end to end and having an interface, placing the stack in a tube sealed at its two ends and made from a material whose thermal expansion coefficient is well below that of the metals forming the first and second wires, placing spacers made from a ceramic material between the tube and the stack in such a way that the free end of each wire is immobilised with respect to one of the ends of the tube and heating the assembly at a temperature less than the melting temperatures of the metals of which said first and second wires are made, so that a diffusion weld is obtained at the contacting ends of the first and second wires under substantially high pressure caused by the action of the difference in elongations of the tube and the first and second wires.

4,415,759

SOLAR POWER SATELLITE

Robert J. Copeland, Lakewood, Colo., and John D. Martin, Greenville, Tex., assignors to Vought Corporation, Dallas, Tex.

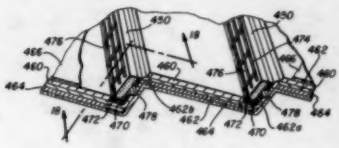
Filed Oct. 13, 1981, Ser. No. 310,012
Int. Cl.³ H01L 31/04
U.S. Cl. 136—246 57 Claims

1. A solar cell unit comprising:

a plurality of spaced radiant energy converting cells having an energy receiving surface responsive to radiant energy received thereon for generating electric energy, and

a light reflective fin positioned between each adjacent pair of said converter cells, each fin being thermally and electrically connected to said pair of converter cells on either side thereof, the electrical connection on one side being to the energy receiving surface of the converter cell and on the opposite side to the surface of the adjacent cell opposite the energy receiving surface, said fins providing series electrical connection between the converter cells.

31. A solar collector comprising:



a collector frame structure having a downwardly facing concave first curved portion of decreasing radius of curvature from the first end to the second end thereof, and an upwardly facing concave second curved portion with the first end thereof adjacent the second end of said first curved portion, said second curved portion decreasing in radius of curvature from the first end to the second end thereof, and

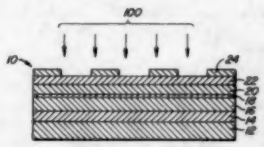
a solar cell unit mounted on the concave surfaces of each of said first and second curved portions, said solar cell units having an energy receiving surface responsive to radiant energy received thereon to generate electric energy.

4,415,760

AMORPHOUS SILICON SOLAR CELLS INCORPORATING AN INSULATING LAYER IN THE BODY OF AMORPHOUS SILICON AND A METHOD OF SUPPRESSING THE BACK DIFFUSION OF HOLES INTO AN N-TYPE REGION

Arun Madan, Moraga, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 12, 1982, Ser. No. 367,815
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—258 16 Claims



1. In an hydrogenated amorphous silicon solar cell which comprises an electrically conductive substrate, a layer of hydrogenated amorphous silicon ohmically contacting said electrically conductive substrate and having regions of differing conductivity with at least one interface between an incident N-type or N^+-type region of hydrogenated amorphous silicon and a photoactive region of intrinsic hydrogenated amorphous silicon, and means for electrically contacting said layer of hydrogenated amorphous silicon opposite to the side contacting said electrically conductive substrate, the improvement wherein the layer of hydrogenated amorphous silicon incorporates an insulator layer between said incident N-type or N^+-type region and said photoactive intrinsic region wherein said insulator has a sufficient thickness to permit electrons to pass

therethrough while reflecting holes back into the photoactive intrinsic region.

4,415,761

TAPED ELECTRIC CABLE

Paolo G. Priaroggia, and Elio Occhini, both of Milan, Italy, assignors to Societa Cavi Pirelli Societa per Azioni, Milan, Italy

Filed Jul. 15, 1981, Ser. No. 283,556
Claims priority, application Italy, Jun. 6, 1980, 22595 A/80
Int. Cl.³ H01B 7/02, 9/06
U.S. Cl. 174—25 R **4 Claims**

1. An electric cable suitable for use at operating voltages of at least 1000 Kilovolts, said cable having a conductor and at least three insulating layers helically wound around the conductor, each layer being formed by tape impregnated with an insulating material and having surfaces without wrinkles, the tape of each layer being wound with a gap between the side edges of adjacent turns of the tape and with said gap between said side edges being offset with respect to the gap between the side edges of the turns of the tape of the next adjacent layer, whereby the said gap of one layer is covered by the tape of said next adjacent layer, and at least one of said layers comprising at least two tapes wound in side-by-side relation with their side edges in substantially parallel relation to provide multi-start helical tapes, said two tapes having their edges spaced apart in the direction of the length of the cable and the angle between the side edges of each tape and a plane extending axially of the cable being less than 75°.

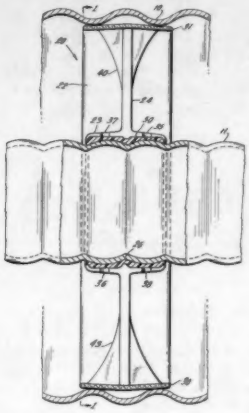
4,415,762

FLEXIBLE GAS-INSULATED ELECTRICAL CABLE HAVING NON-METALLIC FLEXIBLE INSERTS BETWEEN CENTRAL CONDUCTOR AND SUPPORT INSULATORS

Jonathan Z. Ponder, Hatfield, Pa., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Oct. 31, 1980, Ser. No. 202,570
Int. Cl.³ H01B 9/04; H02G 5/06
U.S. Cl. 174—28 **5 Claims**

1. A high voltage flexible cable comprising an elongated outer conductive housing, a central conductor having a corrugated outer conductor member, said central conductor extending coextensively with said outer housing, a plurality of support insulators spaced along the axis of said cable each having a central opening receiving and supporting said central conductor within said outer housing; a dielectric gas under positive pressure filling the interior of said outer housing; each of said support insulators formed of an injection-molded plastic insulation material which is harder than the exterior surface of the corrugated outer conductor member of said central conductor; said exterior surface of the corrugated outer conductor member of said central conductor being axially movable relative to said interior surfaces of said support insulators due to bending forces applied to said cable; wherein the improvement comprises a plurality of flexible material pads consisting of a silicone rubber, an individual one of said pads being compressed between the interior surface of the central opening of each support insulator and said exterior surface of the corrugated outer conductor member of said central conductor to prevent scratching of said exterior surface of the corrugated outer conductor member of said central conductor by said interior surfaces of said support insulators due to relative axial



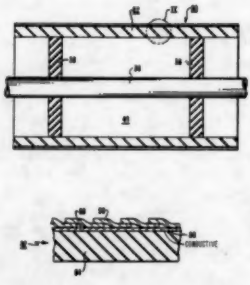
motion between said central conductor and said support insulators.

4,415,763

GAS-INSULATED TRANSMISSION LINE HAVING IMPROVED OUTER ENCLOSURE

Alan H. Cookson, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 206,917, Nov. 14, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,568
Int. Cl.³ H02G 5/06; H01B 9/06
U.S. Cl. 174—28 **3 Claims**



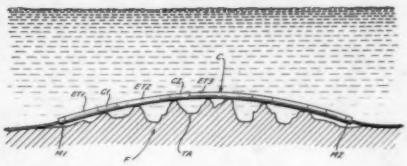
1. A gas-insulated transmission line comprising:
a tubular hollow insulating outer sheath;
an electrically conducting material layer disposed on the exterior surface of said outer sheath;
an electrically conducting foil wrapped around the exterior surface of said outer sheath and said material layer;
an inner conductor insulatably supported within said outer sheath; and
an insulating gas disposed within said outer sheath.

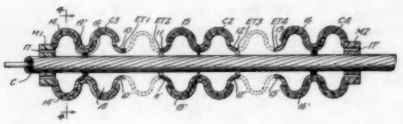
4,415,764

SUBMARINE ELECTRIC CABLE WITH TUBULAR STIFFENING MEANS AND METHOD OF APPLYING THE STIFFENING MEANS

Paolo G. Priaroggia; Giuseppe Bianchi, both of Milan, and Angelo Sala, Merate, all of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Nov. 4, 1981, Ser. No. 318,258
Claims priority, application Italy, Nov. 12, 1980, 25928 A/80
Int. Cl.³ H02G 9/02, 1/10; H01B 7/24
U.S. Cl. 174—37 17 Claims





1. Submarine electric cable installation on the bottom of a body of water, said bottom having both a relatively smooth tract and a relatively uneven tract, said cable comprising at least one conductor having a screen and insulation therearound and having an outer protective covering around said insulation and said cable having a portion thereof overlying said uneven tract, said installation comprising tubular stiffening means around said portion of said cable and preventing contact of said cable with said uneven tract, said tubular stiffening means having a rigidity greater than the rigidity of said cable and a length sufficient to prevent bending of said portion of said cable to a radius less than the minimum bending radius of said cable, and said tubular stiffening means having at least a portion of its inner wall spaced from said outer protective covering and having openings therin to permit water to flow into and out of and within said tubular stiffening means and thereby cool said cable, and said cable being without said tubular stiffening means therearound at a portion thereof which overlies said relatively smooth tract.

17. Method for disposing a tubular stiffening-means around a submarine electric cable having a protective covering during the laying of the cable from a ship on water, said ship having a cable capstan and said tubular stiffening-means being assembled around the cable portion between said capstan and the water during the laying of the cable in the water, characterized by the fact of comprising the following operations:

locking, onto the protective covering of the cable, a first clamp that has its outer diameter at least equal to the outer diameter of said tubular stiffening-means;

disposing around the cable a first and a second shell having C-shaped cross-sections and annular corrugations, for forming a first tubular element that is in contact with said first clamp;

circumscribing with a first collar the extremity of said first tubular element that is adjacent said first clamp, said first collar comprising a first and a second semi-collar having C-shaped cross-sections and annular corrugations, said first and second semi-collars having corrugations that are similar to the corrugations of said first and second shells, and the inner projecting parts of said corrugations of said first and second semi-collars becoming inserted into the outer corresponding depressions of the corrugations of said first and second shells;

disposing around the cable a third and a fourth shell having C-shaped cross-sections and annular corrugations, for forming a second tubular element in series to said first tubular element;

circumscribing with a second collar the adjacent extremities of said first and second tubular elements in series, said second collar comprising a third and a fourth semi-collar having C-shaped cross-sections and annular corrugations that are similar to the corrugations of said shells, the inner projecting parts of the corrugations of said second collar being placed in correspondence of the outer depressions of the adjacent terminal corrugations of said first and second contiguous tubular elements;

disposing, using the same steps, a plurality of additional tubular elements and collars around the cable, for forming a tubular stiffening-means of the desired length;

circumscribing with another collar the end of the last tubular element of said plurality; and

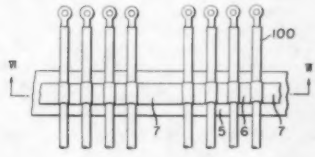
locking, on said protective covering of the cable, a second clamp that has its outer diameter at least equal to the outer diameter of said tubular stiffening-means.

4,415,765

WIRE HARNESS

Tatsuya Iwasa; Takayuki Inoue, and Noriyuki Mizuta, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP80/00272, § 371 Date Apr. 30, 1981, § 102(e) Date Apr. 30, 1981, PCT Pub. No. WO81/01343, PCT Pub. Date May 14, 1981
PCT Filed Oct. 31, 1980, Ser. No. 261,161
Claims priority, application Japan, Nov. 2, 1979, 54-142567; Nov. 8, 1979, 54-145208; Nov. 26, 1979, 54-153181
Int. Cl.³ H01B 7/00
U.S. Cl. 174—72 A 2 Claims



1. A wire harness comprising:

a plurality of connecting wires with each said wire being provided with terminals on each end and wherein said connecting wires are used for wiring electrical control devices;

a paper tape on which each of said wires is placed side-by-side and independent of each other with a space therebetween;

an adhesive tape adhering to said paper tape and covering the connecting wires on the side opposite said paper tape in order to hold said connecting wires on said paper tape, wherein said connecting wires are divided into a plurality of sections corresponding to a unit of wiring for each section wherein the spacing between sections is larger than the spacing between each of said wires in each section so that each unit of wiring may be easily separated manually from each of the other units by breaking said paper and adhesive tape between said sections and wherein the spacing between said wires is such that said harness is capable of being folded together for transportation;

wherein data for each connecting wire is printed on the surface opposite said wires of said paper tape; and

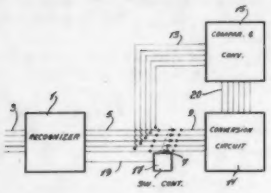
wherein said adhesive tape and said paper tape may be easily

separated manually in order to easily remove the respective connecting wires.

4,415,766
RECOGNIZER/CONVERTER FOR ARABIC AND OTHER LANGUAGE CODES

Syed S. Hyder, Westmount, Canada, assignor to Alephtran Technology N.V., Curacao, Netherlands Antilles

Filed Jun. 6, 1980, Ser. No. 157,296
Int. Cl.³ H04L *3/00*
U.S. Cl. 178—30 **4 Claims**



4. A converter for converting code words of a first coding system, representing alphabetic characters of a language, to other code words of a second coding system, said language having special characters comprising combinations consisting of modifying symbols for respective ones of said characters together with said respective characters, said first coding system representing each said special character as two code words, a first code word for said character and a second code word for said modifying symbol;

said converter comprising:

means for recognizing the code words representative of said special characters by recognizing the code words representative of said modifying symbols;

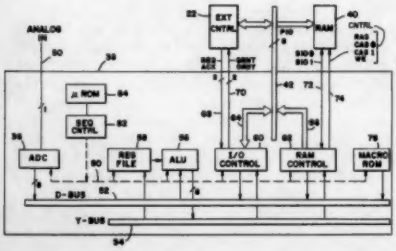
means for converting any two code words determined to be representative of a respective one of the special characters to a single code word of the second coding system; and

analyzing means to analyze a code word following the code word for a modifying symbol to determine if the following code word and the code word for the modifying symbol are together representative of a special character.

4,415,767
METHOD AND APPARATUS FOR SPEECH RECOGNITION AND REPRODUCTION

Stephen P. Gill, Atherton; Lawrence F. Wagner, Berkeley; Gregory G. Frye, San Leandro, and Klaus-Peter A. Bantowsky, Hayward, all of Calif., assignors to Votan, Fremont, Calif.

Filed Oct. 19, 1981, Ser. No. 312,801
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—45 **28 Claims**



1. A method for providing a spectral analysis of an analog signal waveform comprising the steps of:

dividing the total incoming analog signal into time frames of equal duration;

converting the analog signal to a sequence of discrete signal amplitudes at equally spaced time intervals in each frame;

transforming the sequence of discrete signal amplitudes to a sequence of complex spectral amplitudes, each such spectral amplitude representing the magnitude and phase of a function V(n,k) defined as:

$$V(n,k) = \exp\left[j\pi\left(\sum_{r=0}^{p}\sum_{t=0}^{m} n_{p-r}\,k_{r-t}\,2^{-t} + \phi\right)\right]$$

wherein

k = time sequence index

n = frequency sequence index

r,t = integer summation indexes

m = time function parameter defining the number of retained bits

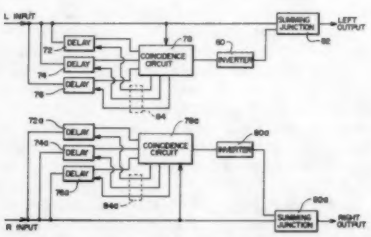
ϕ = phase adjustment function

and the subscripts (p-r) and (r-t) for n and k refer to bit locations in their binary representation with bit locations ranging from o to the maximum value p and subscript values outside this range representing vanishing values.

4,415,768
TUNING APPARATUS AND METHOD

Robert W. Carver, 330 Avenue A, Snohomish, Wash. 98290

Filed May 28, 1981, Ser. No. 268,084
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—10 **5 Claims**



1. An apparatus adapted to improve reproduction of a signal, such as an FM stereo signal, comprising:

a. first means to receive a signal input means and produce a first delayed signal output,

b. second means to receive said signal input means and said first delayed signal output and to compare these to produce a second delayed signal output corresponding to portions of said signal input means and said first delayed signal output that correspond to one another,

c. third means to invert said second delayed signal output and combine the same with said signal input means to produce an output signal,

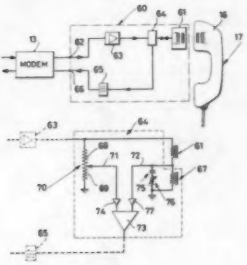
d. control feedback means to control the delay of the first means to coincide more closely with the corresponding signal portion in the signal input means, and

e. said first means comprising a plurality of delay means to produce a plurality of first delayed signal output portions, each having different delayed increments.

4,415,769
ELECTROMAGNETIC TELEPHONE COUPLING DEVICE

Antonio Gray, Segrate, Italy, assignor to C. I. S. E., SpA, Italy

Filed Oct. 26, 1981, Ser. No. 315,075
Claims priority, application Italy, Oct. 27, 1980, 25596 A/80; Jan. 28, 1981, 19378 A/81
Int. Cl.³ H04M 11/00, 9/08
U.S. Cl. 179—2 C 4 Claims



1. A device for the transmission and the receipt of electronic signals through a telephone line to which a telephone set is connected having inductive elements composed at least of the line transformer of the telephone set, the acoustical-electric-transducer of the microphone of the telephone set, and the acoustical-electric transducer of of the receiver of the telephone set comprising

a signal input and a signal output connected to electromagnetic interlinking means including a main coil and a secondary coil which are positioned in close proximity to at least one of the inductive elements of the telephone set, said electromagnetic interlinking means being adapted to transmit to the inductive element the signal coming from said signal input and to send to said signal output the signal received by the inductive element, said signal input and said signal output both being connected to said main coil through a signal separation circuit for the signal transmitted by said signal input to said main coil through a linear amplifier and for the signal sent by said main coil to said output through a band-pass filter, said main coil being positioned in the vicinity of one of the inductive elements of the telephone set,

said separator circuit including a balanced bridge circuit wherein two consecutive sides of said balanced bridge circuit are formed by said main coil and said secondary coil, said two sides being fed at the ends of said coils at which they are not connected to each other with the signal transmitted by said signal input, the signal which is present between said two coils and the signal which is present between impedances in the remaining two sides of said balanced bridge circuit being separately fed, each through a linear amplifier, to a differential amplifier having its output connected to the input of said band-pass filter.

4,415,770
MALFUNCTION DETECTION SYSTEM FOR A MOBILE RADIO TELEPHONE SYSTEM

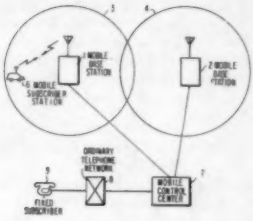
Tomokazu Kai, and Hidetoshi Nakahara, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 367,852
Claims priority, application Japan, Apr. 24, 1981, 56-62900
Int. Cl.³ H04B 3/60, 17/00; H04Q 7/04
U.S. Cl. 179—2 EB 4 Claims

1. In a mobile radio telephone system of the type having mobile subscriber stations; mobile base stations, each mobile base station having a plurality of speech channel transmitter/receivers to transmit and receive signals respectively through a plurality of speech channels and an access channel transmitter/receiver to control calls from said mobile subscriber stations through an access chanell; and a mobile control center capable of enabling communication between said mobile subscriber stations and of connecting a telephone exchange network to said mobile subscriber stations by way of said mobile base stations, the improvement comprising:

detecting means connected to the output of said access channel receiver for detecting both a calling signal originated from said mobile subscriber stations and a test calling signal to provide a detection output;

test transmitter means responsive to a first control signal for transmitting said test calling signal to said access channel receiver through said access channel;



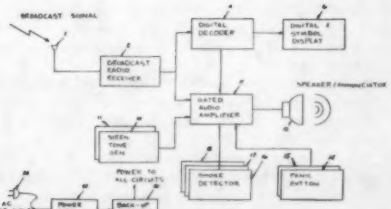
center controller means responsive to said test calling signal received by said access channel receiver for transmitting a first response signal to test receiver means through said access channel transmitter, said test receiver means receiving said first response signal transmitted from said access channel transmitter; and

controller means connected to said detecting means, test transmitter and receiver means and center controller means for generating said first control signal when said detection output is not generated within a first predetermined interval of time and supplying a first alarm signal to said center controller when the first response signal is not received within a second predetermined interval of time after the transmission of said test calling signal.

4,415,771
PUBLIC ALERT AND ADVISORY SYSTEMS

Louis Martinez, 18939 Milmore Ave., Carson, Calif. 90746

Filed Apr. 3, 1981, Ser. No. 250,779
Int. Cl.³ H04B 7/00
U.S. Cl. 179—5 R 40 Claims



39. A public alert and advisory system comprising;

a central transmitter station including first transmitter modulation means for modulating a signal to be transmitted with audio programming, using a first modulation technique, for transmission of the programming to manually controllable first receivers having first receiver demodula-

tion means responsive to signals modulated with said first modulation technique for the reception and demodulation of said modulated signal to allow selective perception of the programming by members of the public,

second modulation means coupled to said central transmitter station for modulation of the signal to be transmitted with public alert and advisory information utilizing a second modulation technique to which said first receiver demodulation means are not primarily responsive,

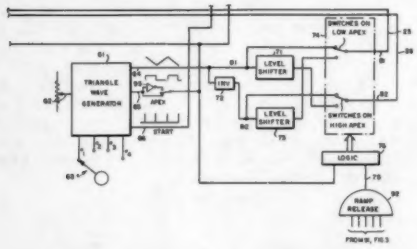
alert and advisory signal means coupled to said second modulation means for providing a signal responsive to alert and advisory information thereto which is at least partially a voice signal, and

a plurality of remote second receivers, each of said second receivers having second receiver demodulation means responsive to signals modulated with said second modulation technique for the reception and demodulation of the transmitted signal to provide the public alert and advisory information at the respective remote location, said second receivers each also including presentation means for presenting said alert and advisory information in humanly perceivable form at the respective remote location.

4,415,772
GAPLESS SPLICING OF PITCH ALTERED WAVEFORMS

William G. Eppler, Jr., Norwalk, Conn.; Michael A. Klasco, New York, N.Y.; Irwin H. Kornfeld, Brooklyn, N.Y., and Rex Nathanson, Littleneck, N.Y., assignors to The Variable Speech Control Company ("VSC"), San Francisco, Calif.

Filed May 11, 1981, Ser. No. 262,046
Int. Cl.³ G10L *1/00*
U.S. Cl. 369—60 **19 Claims**



1. A time compression/expansion system in which the playback speed for a recording is selected such that the frequencies of electric signals derived from playback of a recorded work are different than their original values and said electric signals are processed to change their frequency by periodic variable time delay to obtain a desired pitch change comprising:

dual variable time delay means each operable for variably delaying said playback signal in response to respective control signals;

control signal means coupled to supply said control signals to said dual delay means for periodically varying the time delay in respective said dual delay means inversely with alternate increasing the decreasing delay;

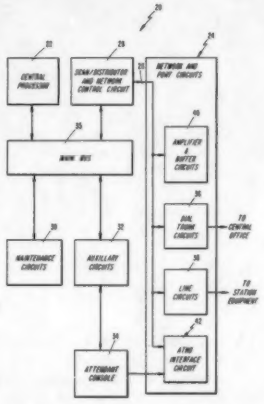
switching means operable for alternately selecting the output of the delay means having the desired pitch change during each period of delay variation; and

transition control means which includes means for extending the interval of delay variation of the selected delay means to continue said selected delay variation beyond the normal periodic switching point and means for operating said switching means during the extended interval after each variation period in response to detecting a signal level and slope match between the present values of the just ending and next ensuing pitch corrected signal outputs of said dual delay means.

4,415,773
METHODS OF ESTABLISHING A SWITCHING CONNECTION WITHIN A SWITCHING SYSTEM

Margaret L. Martin, Boulder, Colo., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,374
Int. Cl.³ H04Q *3/10, 3/54*
U.S. Cl. 179—18 AD **3 Claims**



3. A method of establishing a connection to a called subscriber station within a switching system wherein the system uses n+1 digits to establish a connection, which comprises the steps of:

storing n dialed digits representing a called subscriber station number;

decoding the stored digits to determine if a connection to a subscriber station is to be established;

adding an additional digit to the stored n digits when it is determined that a connection to the subscriber station is to be established;

determining whether the additional digit is a valid station code;

removing the additional digit from the stored n+1 digits;

utilizing the remaining stored n digits to identify the equipment location of the subscriber station; and

establishing a connection to the called subscriber station identified by the equipment location.

4,415,774
LINE POWERED MODEM AUTOMATIC ANSWER DEVICE POWERED FROM EQUIPMENT

R. Byron Driver, Huntsville, Ala., assignor to Universal Data Systems, Inc., Huntsville, Ala.

Filed Nov. 25, 1981, Ser. No. 324,842
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 DP **9 Claims**

1. For use in a modem powered by the telephone line and connected to data equipment which sends a data equipment modem answer control signal having an answer state when ready to receive data and a no-answer state when not ready to receive data;

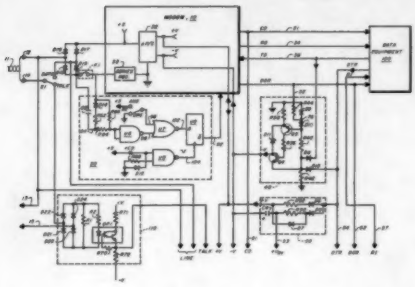
an automatic answer device operative upon receipt of a ring signal from said telephone line when said modem answer control signal is in said answer state to place said modem in the answer mode (off-hook) and to pass data received by said modem to said data equipment, said automatic answering device comprising;

a ring detector means generating a ring indicator signal when said ring signal appears on said telephone line;

an answer relay for connecting said modem to said telephone line according to a relay answer signal;

energy storage means for receiving and storing said modem answer control signal; and

an answer control means connecting said answer relay and said energy storage means for producing said relay answer



signal upon the receipt of said ring indicator signal when said modem answer signal is in said answer state for causing actuation of said answer relay from said storage means thereby connecting said telephone line to said modem.

4,415,775
ARRANGEMENT FOR EXCHANGING SIGNALS BETWEEN SEPARATED CIRCUITS

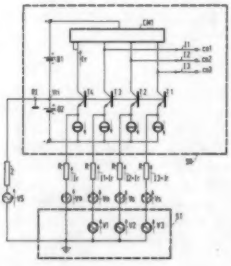
Aloysius J. Nijman, and Franciscus A. C. M. Schoofs, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,945

Claims priority, application Netherlands, Sep. 2, 1980, 8004970

Int. Cl.³ H04B *3/02, 3/30*

U.S. Cl. 179—78 R **5 Claims**



1. An arrangement for transmitting signals from a first circuit arrangement comprising a first voltage reference point and a plurality of signal sources each having one side connected to the first voltage reference point to a second circuit arrangement comprising a second voltage reference point and a plurality of signal sinks each having one side connected to the second voltage reference point, the two voltage reference points being separated by an impedance having an impedance value different from zero it being possible that a disturbing voltage is present between the said voltage reference points, characterized in that for the transmission of each one of the signals of the plurality of signal sources from the first to the second circuit arrangement one separate signal conductor which includes an impedance having a high impedance value, denoted high ohmic signal conductor, is provided between the relevant signal source of the first circuit arrangement and a separate signal sink of the second circuit arrangement, in that at least two of these high ohmic signal conductors are provided for the transmission of at least two independent signals and that a signal conductor which includes an impedance having a high impedance value, denoted high ohmic reference-signal conductor is provided between the first voltage reference point of the first circuit arrangement and a separate signal sink of the second circuit arrangement and that the second circuit arrangement includes means for linearly combining the currents flowing in the high ohmic signal conductors and the high ohmic reference-signal conductor for generating signal currents in the second circuit arrangement which are proportional to the signals transmitted by the first circuit arrangement to the second circuit arrangement and are substantially independent of the disturbing voltage which may be present between the voltage reference points of the two circuit arrangements.

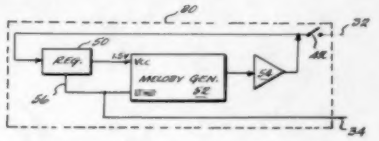
4,415,776
TELEPHONE MUSIC-ON-HOLD DEVICE

Robin K. L. Tang, 13 D 514-3 Tung-hwa S. Rd., Taipei, Taiwan, and Donald C. L. Tang, 11120 Candlelight La., Potomac, Md. 20854

Filed Apr. 17, 1981, Ser. No. 255,272

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **14 Claims**



1. A telephone music-on-hold device for generating music and coupling it onto a telephone line comprising:

a regulator adapted to be coupled to a telephone line, for drawing power from the telephone line and supplying regulated power;

a melody circuit powered by said regulator, for generating a multi-note musical melody; and

an amplifier for amplifying the musical melody and coupling it to the telephone line,

the regulator, melody circuit, and amplifier being constructed as a single unit of sufficiently small size to be inserted into a hollow portion of a telephone handset and having only two lead wires associated therewith for connection to terminals of the telephone handset.

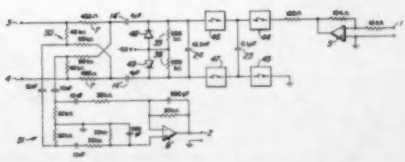
4,415,777
HYBRID CIRCUIT INCLUDING CAPACITIVE CHARGE-TRANSFER MEANS

David G. Agnew, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 20, 1981, Ser. No. 323,541

Int. Cl.³ H04B *1/58*

U.S. Cl. 179—170 NC **19 Claims**



1. A hybrid circuit comprising transmit path means, for coupling signals from a two-wire line to a transmit path of a four-wire line, and receive path means, for coupling signals from a receive path of the four-wire line to the two-wire line,

wherein at least one of said transmit path means and said receive path means comprises capacitive charge-transfer means comprising a plurality of parallel capacitors, a plurality of series switches, and means for cyclically controlling said switches to transfer signals between two ports of said charge-transfer means whilst electrically isolating said ports from one another.

4,415,778

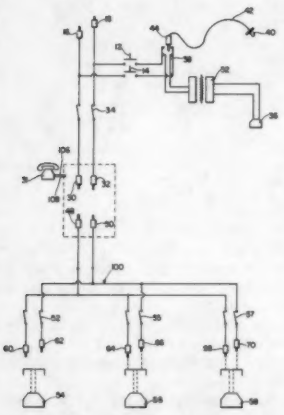
SUBSCRIBER TELEPHONE TEST SET

Robert L. Turner, P.O. Box 44, Tate, Ga. 30177

Filed Nov. 30, 1981, Ser. No. 325,808

Int. Cl.³ H04B *17/00*; H04M *1/24*

U.S. Cl. 179—175.1 R **7 Claims**



1. A telephone subscriber test set of the type enabling the subscriber to isolate trouble both in the household interior telephone equipment, including interior household lines and telephone receiver, and in the telephone company central office exterior lines, extending to the household lines, comprising:

A. A normally "closed" interior household telephone line switch mounted in the household interior lines and adapted for passing the telephone company dial tone directly to the household telephone receiver, unless "opened" for test of the telephone company central office lines; and

B. A central office exterior lines test circuit connected to the household interior lines between the telephone company central office lines and the interior household telephone line switch so as to isolate trouble in the central office lines, said central office lines test circuit including:

i. a normally "open" master test switch mounted in said test circuit;

ii. a transformer mounted in said test circuit having a first winding in series with said master test switch, and a second winding; and

iii. a dial tone speaker in shunt with said second winding, said test circuit adapted to amplify the dial tone emanating in the central office lines, as the master test switch is "closed".

4,415,779

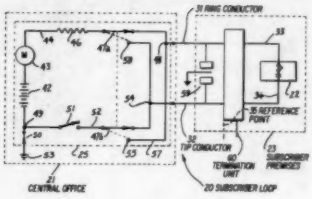
METHODS OF AND APPARATUS FOR TESTING TELEPHONE SUBSCRIBER LOOP TO LOCATE A FAULT RELATIVE TO A REFERENCE POINT

Howard C. Bowman, Winston-Salem, N.C., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 274,592

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 F **10 Claims**



1. A method of determining whether a fault in a telephone subscriber loop exists between a central office and a reference point or between the reference point and subscriber terminal equipment, said method comprising the steps of:

applying a test voltage signal from a source capable of providing a continuous unidirectional test current in a sequence to a ring conductor of the subscriber loop and ground, to a tip conductor of the subscriber loop and ground, and between the ring and the tip conductors, each of the conductors having in parallel a voltage sensitive device and an associated energy storage device connected in series therewith;

limiting the amplitude of the test current;

connecting a measuring device to the loop to test for a fault current between the ring conductor and ground, between the tip conductor and ground, and between the ring and tip conductors;

detecting a substantially constant current flow from the ring or the tip conductor to ground or from the ring to the tip conductor in response to a fault between the central office and the reference point; and

periodically interrupting the current flow seriatim from the central office to ground and between the tip and the ring conductors to provide an oscillatory current reading on the measuring device in response to a fault between the reference point and the terminal equipment, said step of periodically interrupting the current flow being accomplished by charging one of the energy storage devices until an accumulated charge on the energy storage device exceeds a threshold voltage of the associated voltage sensitive device whereupon the voltage sensitive device is rendered conductive and causes the accumulated charge to be dissipated.

4,415,780

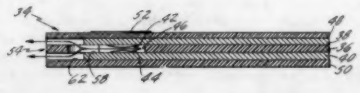
KEYBOARD WITH EDGE VENT

James B. Daugherty, and Frederick A. Balash, both of Mesa, Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed May 28, 1981, Ser. No. 267,787

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **10 Claims**



1. An electrical switch assembly comprising:

first circuitry layer means, said first circuitry layer means including a flexible non-conductive substrate having first

and second oppositely disposed surfaces, said first circuitry layer means having an electrically conductive pattern disposed upon its second surface;

second circuitry layer means, said second circuitry layer means including a non-conductive substrate having first and second oppositely disposed surfaces, said second circuitry layer means having an electrically conductive pattern disposed upon its first surface, said first surface of said second circuitry layer means being positioned to face said second surface of said first circuitry layer means;

spacer means, said spacer means being a layer of electrical insulating material positioned between said first and said second circuitry layer means, said spacer means cooperating with said first and said second circuitry layer means to define at least a first peripheral edge of the switch assembly, said spacer means being provided with at least one aperture which forms a cavity between said first and second circuitry layer means whereby said conductive patterns on said circuitry layer means may be moved into electrical contact with one another; and

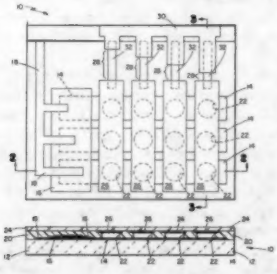
vent passage means for venting said cavity, said vent passage means extending from said switch assembly first peripheral edge to said cavity whereby gas may flow freely between said edge and said cavity, said vent passage means comprising interconnected passage segments in said spacer means and in at least one of said first and second circuitry layer means.

4,415,781

MEMBRANE SWITCH

Norman J. Frame, Whitefish Bay; James P. Walber, Cedar Grove, and Jan M. Janick, Brookfield, all of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Nov. 20, 1981, Ser. No. 323,290
Int. Cl.³ H01H *13/70*; G06F *3/02*
U.S. Cl. 200—5 A **10 Claims**



1. A switch assembly comprising

a flexible membrane supporting a first contact,

a spacer layer positioned below said membrane for spacing it from a facing surface having a second contact aligned with said first contact,

a capacitor and resistor electrically connected to said first and second contacts in series, and

first and second electrical leads for connecting said contacts and said capacitor and resistor to external circuitry,

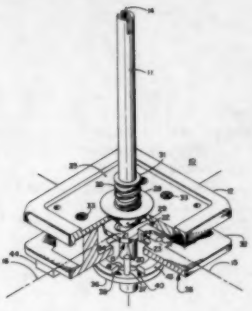
whereby switch activation can be sensed by external circuitry connected to said leads by sensing a unique resistance and capacitance combination across said leads.

4,415,782

SLIDING DISC TRANSDUCER ACTUATOR

Dwayne R. Elmberg, Coon Rapids, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 2, 1981, Ser. No. 308,066
Int. Cl.³ H01H *25/04*
U.S. Cl. 200—6 A **20 Claims**



1. An actuator mechanism for converting two axis pivoting motion to planar motion comprising:

a shaft extending along a longitudinal axis and mounted by first support means for pivotal movement about two distinct axes transverse to the longitudinal axis at a pivot point thereon;

a disc member connected to said shaft at a location spaced from the pivot point; said disc member comprising a flexible central web at least partially surrounded by a peripheral rim; and

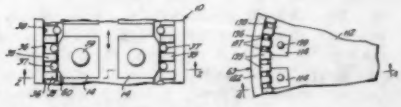
second support means for supporting said disc member generally in a plane transverse to the longitudinal axis and confining said peripheral rim of said disc member to movement in the plane.

4,415,783

MULTIPOLE DATA SWITCH

Peter C. Hung, Stony Brook, N.Y., assignor to Porta Systems Comp., Syosset, N.Y.

Filed Sep. 20, 1982, Ser. No. 420,322
Int. Cl.³ H01H *19/54*
U.S. Cl. 200—11 A **2 Claims**



1. A multipole switch comprising a base element and a sliding element arranged coaxially for relative incremental movement; said base element including a contact supporting area defining a plurality of parallel bores, a plurality of elongated totally rectilinear wire-like flexible contacts, each of said contacts having a portion thereof inserted in one of said bores and having a free end spaced from said portions; a plurality of septums associated with said base element in the area of said free ends of said contacts, and defining interstices therebetween within which said free ends are laterally deflectable; said sliding element being arranged for relative movement on said base element and having a plurality of contact means projecting therefrom to overlie said flexible contacts to selectively bridge adjacent pairs thereof; said base element including a lower wall containing said bores, a pair of side walls extending upwardly from said lower wall, and a cover member overlying

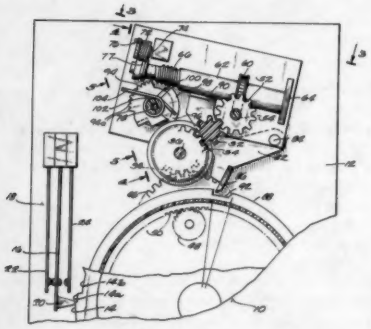
free upper edge surfaces of said side walls to define an elongated cavity, said sliding element being disposed within said cavity; said septums being mounted upon an inner surface of said cover and serving to position said cover member relative to said side walls by contact therewith.

4,415,784

TIMER WITH DELAYED START CAPABILITY

James M. Thornbery, Vernon Hills; George Obermann, Niles, and Edward J. Mateja, Hillside, all of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Sep. 11, 1981, Ser. No. 301,142
Int. Cl.³ H01H *43/00*
U.S. Cl. 200—35 R **12 Claims**



12. A program timer of the type having a motor driving a timing cam to actuate switches according to a desired sequence from the start to end of a program, the improvement being provision for delaying the start of a program for a selected period, comprising,

a clutch in the drive between the motor and the timing cam,

gear means driven by the motor from a point between the motor and the clutch input, said gear means including a worm gear,

a ratchet segment mounted on a rotatable shaft for movement from a zero delay position in which it is not engaged with said worm gear to various positions in which one or more ratchet teeth are engaged with the worm gear,

manual means for rotating the shaft,

means responsive to rotation of the shaft from the zero delay position to operate said clutch to interrupt the drive to the timing cam and to re-engage the clutch on return to the zero delay position,

said worm gear being operative to drive the segment back towards the zero delay position,

a spring biasing the segment to the zero delay position,

said worm gear being movable between an active position in which it can engage said segment and an inactive position in which it cannot engage the segment,

means responsive to the position of the timing cam to move said worm gear between said active and inactive positions and operative to position the worm gear in its active position only when the timing cam is in its start position,

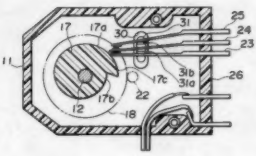
said segment returning to the zero delay position under influence of the spring bias if the timing cam is moved out of its start position while the segment is engaged with the worm gear.

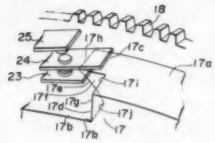
4,415,785

TIMER SWITCH

Kuniaki Uno; Saichi Katumata; Toshio Tanaka, all of Susono, and Hiroshi Omata, Gotenba, all of Japan, assignors to Kabushiki Kaisha Higashifuji Seisakusho, Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,616
Claims priority, application Japan, Jun. 23, 1980, 55-84767
Int. Cl.³ H01H *43/10*
U.S. Cl. 200—38 B **8 Claims**





1. A timer switch which comprises:

(a) a casing;

(b) an electric motor mounted on said casing;

(c) a cam member of a generally disc-shape having a cam surface at its periphery, said cam surface being stepped to provide a depressed portion and a shoulder portion adjacent thereto, said cam member being operatively connected to said motor for rotation at a constant speed;

(d) a shaft mounted on said casing for rotation about its axis, said cam member being fixedly mounted on said shaft for rotation therewith, said shaft extending exteriorly of said casing; and

(e) an electrical switching means including a pair of first and second contact plates of resilient material fixedly mounted on said casing at their one ends in juxtaposed relation;

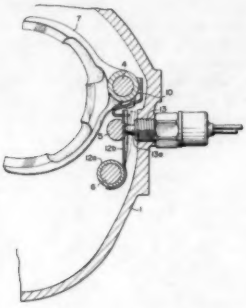
said second contact plate being biased normally into engagement with said first contact plate for energizing said motor through an associated circuit having a power source, said first contact plate being biased into sliding engagement with said cam surface, whereby upon depression of said first contact plate into said depressed portion, said first contact plate is disengaged from said second contact plate to de-energize said motor while said second contact plate is biased into sliding engagement with said shoulder portion, the improvement wherein said cam surface has a notch formed in said shoulder, said notch opening to one side of the cam member; said shaft being operable to be displaced together with said cam member along an axis thereof relative to said casing, whereby upon axial displacement of said shaft in a direction opposite to the one side of cam member when said second contact plate is in engagement with said shoulder portion, said second contact plate is moved into said depressed portion through said notch so that said second contact plate is again biased into engagement with said first contact plate to reset and timer switch.

4,415,786

APPARATUS FOR DETECTING THE NEUTRAL POSITION OF A MANUAL TRANSMISSION FOR MOTOR VEHICLES

Toshiaki Takada, Yokohama, and Kazuyoshi Hiraiwa, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 24, 1982, Ser. No. 361,261
Claims priority, application Japan, Mar. 25, 1981, 56-42406
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.91 2 Claims



1. In combination with a remote control type manual transmission for motor vehicles, including a first, a second and a third shift rod, apparatus for detecting the neutral state of the transmission comprising:

a bracket fixedly mounted on said first shift rod, said bracket having a first recess;

said second shift rod having a second recess;

a swingable arm member comprising a hollow shaft portion and an arm secured thereto, said swingable arm member being swingable mounted on said third shift rod, with said hollow shaft portion thereof loosely fitted thereover and restrained from axial displacement, said arm of said swingable arm member disposed in engagement with said first and second recesses only when said first and second shift rods are at their neutral position; and

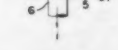
a first switch means adapted to be actuated by said swingable arm member when said arm is disposed in engagement with said first and second recesses.

4,415,787

VACUUM INTERRUPTER

Takashi Yamanaka, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,639
Claims priority, application Japan, Dec. 22, 1980, 55-182216; Dec. 23, 1980, 55-183117
Int. Cl.³ H01H *9/32*
U.S. Cl. 200—144 B 15 Claims



1. An electric circuit interrupter, comprising:

a pair of conductive rods;

a pair of opposed separable electrodes, each said electrode mechanically connected to a respective rod;

said pair of conductive rods movable relative to each other from a position in which said pair of electrodes are in contact with each other to a position in which said pair of electrodes are out of contact with each other whereby an arc is formed between said pair of electrodes;

a current conductor connecting electrically at least one of said conductive rods to a respective electrode at a point deviated from the center thereof; and,

at least one of said electrodes having at least one groove cut therethrough, said at least one groove having one end cutting through a peripheral part of the electrode and another end extending towards another peripheral part of the electrode to form a current passage in the form of at least one coil turn passing through the electrode partially partitioned by the groove,

whereby a magnetic field is formed in parallel to the arc between said pair of electrodes;

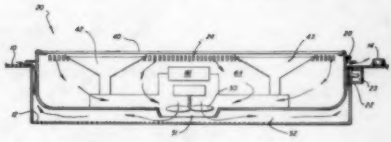
each said electrode connected to a respective conductive rod through a reinforcing material for reinforcing the mechanical connection therebetween and for preventing an eddy current in each said electrode.

4,415,788

INDUCTION CARTRIDGE

Thomas R. Field, Noblesville, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.

Filed Jun. 8, 1981, Ser. No. 271,462
Int. Cl.³ H05B *9/02*
U.S. Cl. 219—10.49 R 9 Claims



1. A cooking stove or range for selectively receiving cooking cartridge means comprising:

housing means having at least one pan-like member forming a recess;

cooking cartridge means having a top, bottom and sides defining a first cavity containing induction heating means and fan means and adapted to be operatively received in said recess;

flange means extending around the sides of said cartridge means and dividing said cartridge means into an upper and a lower portion;

spacer means secured to said cartridge means beneath said flange means and adapted to coact with said housing means to support said cartridge means so that said lower portion is received in said recess and spaced from said pan-like member to define a second cavity therebetween when said cartridge means is operatively connected, said spacer means further forming a gap between said flange means and said housing means to define an air outlet from said second cavity;

a plurality of ports on at least one side of said cartridge means and located in said upper portion for defining an air inlet to said first cavity within said cartridge means;

said cartridge means bottom defining an opening providing airflow communication between said first and second cavities, said fan means being operable for drawing air into said first cavity through said plurality of air inlet ports and passing it over and thereby cooling said induction heating means and directing the air through said opening into said second cavity formed between said cartridge means and said pan-like member and exhausting it through said air outlet gap.

4,415,789
MICROWAVE OVEN HAVING CONTROLLABLE FREQUENCY MICROWAVE POWER SOURCE

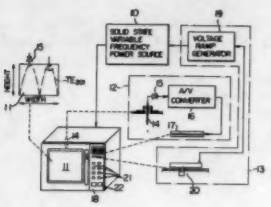
Tomotaka Nobue, and Shigeru Kusunoki, both of Yamatokoriyama, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Dec. 2, 1981, Ser. No. 326,924

Claims priority, application Japan, Dec. 10, 1980, 55-174305; Dec. 11, 1980, 55-175553; Dec. 11, 1980, 55-175554

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **10 Claims**



1. A microwave oven comprising:

a cavity for receiving a load to be heated, said cavity having width, height and depth dimensions for generating a single electromagnetic mode including a TE_{201} mode within a predetermined frequency range, said TE_{201} mode having a uniform electric field distribution along the height dimension of said cavity;

a controllable frequency microwave power source for providing power to said cavity, the operating frequency of said microwave power source being controllable within said predetermined frequency range;

detector means for providing a detector signal indicative of the electric field intensity of said cavity when said cavity is loaded and energized; and

control means for controlling the operating frequency of said microwave power source according to said detector signal to obtain a maximum electric field intensity within said cavity.

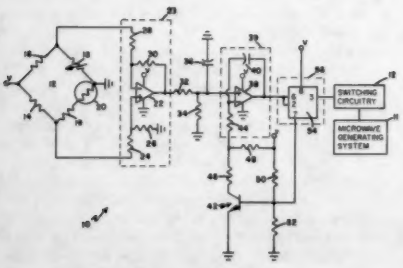
4,415,790
MICROWAVE OVEN TEMPERATURE PROBE CONTROL

Bradford J. Diesch, and Rex E. Fritts, both of Cedar Rapids, Iowa, assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 11, 1982, Ser. No. 347,710

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **17 Claims**



1. A microwave oven comprising:

a microwave generating system;

means for switching said microwave generating system on and off;

means for providing a first signal derived from the temperature of an object placed in said oven, said providing means comprising means for sensing the temperature of an object and means responsive to said sensing means for generating said first signal, said temperature sensing means comprising a resistive temperature probe, said first signal generating means comprising a wheatstone bridge circuit having a first leg comprised of two fixed resistors connected in series and a second leg comprised of a set resistor and said resistive temperature probe connected in series, said first signal generating means further comprising a differential amplifier connected to the node between said fixed resistors and the node between said set resistor and said resistive temperature probe;

means for automatically controlling said switching means in response to said first signal to decrease the power level of said microwave generating system to an equilibrium power level wherein the temperature of said object is held at a predetermined level, said switch controlling means comprising means for providing a second signal derived from said first signal, said switch controlling means further comprising means for periodically energizing said switching means in response to said second signal, said switch controlling means further comprising means for controlling said second signal providing means with said periodic switch energizing means, said second signal providing means comprising an up/down integrator connected to said differential amplifier output, said periodic switch energizing means comprising a comparators exhibiting hysteresis connected to said up/down integrator output and having a latched output connected to an input to said up/down integrator, said second signal providing controlling means comprising a feedback transistor connected between said comparator latch output and the input to said up/down integrator.

4,415,791
BREAKTHROUGH DETECTION MEANS FOR ELECTRIC DISCHARGE MACHINING APPARATUS

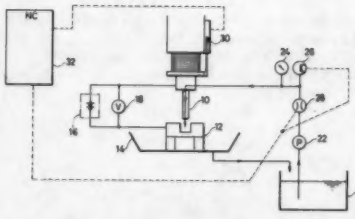
Shigeo Yamada; Tamio Takawashi, and Toshimitsu Sakakibara, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1982, Ser. No. 347,386

Claims priority, application Japan, Feb. 13, 1981, 56-19718; Feb. 13, 1981, 56-19719; Feb. 13, 1981, 56-19720

Int. Cl.³ B23P *1/02, 1/14*

U.S. Cl. 219—69 G **18 Claims**



1. An electric discharge machining apparatus for machining a workpiece with an electric discharge, to form a throughhole in said workpiece, in which an electrode confronts said workpiece with a gap therebetween where the electric discharge is generated, comprising: an electrode position detecting means for detecting the position of said electrode during machining; and means for processing an output signal from said detecting means to produce an output signal representative of a detection factor; at least one further means for producing an output signal representative of a second detection factor, a time in-

stant when an end of said electrode penetrates said workpiece being detected from a combination of said detection factors, and means for ending the machining after said penetration.

4,415,792

ELECTRICAL STUD WELDING DEVICE FOR WELDING STUDS OF DIFFERENT DIAMETERS WITHOUT PRE-TESTING ADJUSTING WELDS

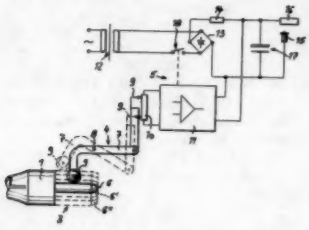
Ernst G. Jordan, Menden, Fed. Rep. of Germany, assignor to OBO Bettermann OHG, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,747

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108891

Int. Cl.³ B23K *9/20*

U.S. Cl. 219—98 **7 Claims**



1. Electrical stud-welding device for welding studs of different diameters comprising a welding head and a stud holder detachably fastened thereto, means for regulating the stud-welding device with respect to a plurality of welding parameters including studs of different dimensions the stud holder serving as a data carrier and control for such variable welding parameters, data-acquisition units activated by the stud holder and location on a part of the stud-welding device, optionally on its welding head, and a centrally disposed data-processing unit associated with the stud-welding device for sensing stud size diameter, which unit controls the variable parameters in accordance with the predetermined sensed data.

4,415,793

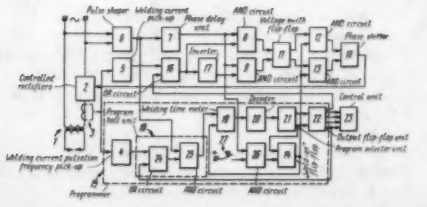
WELDER FOR CONTINUOUS RESISTANCE FLASH-BUTT WELDING

Nikolai V. Podola; Sergei I. Kuchuk-Yatsenko; Vadim P. Krivonos, and Boris L. Grabchev, all of Kiev, U.S.S.R., assignors to AN USSR Institut Elektrosvarki imeni E.O. Patona, Kiev, U.S.S.R.

Filed Aug. 31, 1981, Ser. No. 297,879

Int. Cl.³ B23K *11/04*

U.S. Cl. 219—110 **1 Claim**



1. A resistance flash-butt welder for continuous flash-butt welding, comprising:

a welding transformer having a primary winding circuit and a secondary winding circuit;

controlled rectifiers placed in the primary winding circuit of said welding transformer for controlling the voltage in the secondary winding circuit thereof, and thereby determining the upsetting time of the welding with the voltage being applied;

a current transformer having a primary winding placed in the primary winding circuit of said welding transformer, and a secondary winding;

a welding current pick-up having an input connected to the secondary winding of said current transformer;

a phase shifter having two inputs and an output, said output being electrically connected to said controlled rectifiers for controlling the phase angle opening of said controlled rectifiers;

a pulse shaper having an input connected to the primary winding of said welding transformer for generating pulses synchronized with the supply circuit voltage;

a phase delay unit having an input connected to the output of said pulse shaper for delaying pulses in time formed by said pulse shaper;

a first OR circuit having a first and a second input and an output, the first being connected to the output of said welding current pick-up;

a flip-flop for switching the voltage in the supply circuit at moments when the welding current exceeds its predetermined magnitude, said flip-flop having a first and a second input and a first and a second output;

an inverter having an input connected to the output of said OR circuit;

a first, a second, a third, and a fourth AND circuits each having a first and a second input and an output, the first inputs of said first and said second AND circuits being jointly connected to the output of said phase delay unit, the second input of said first AND circuit being connected to the output of said OR circuit, the second input of said second AND circuit being connected to the output of said inverter, the outputs of said first and second AND circuits being connected to a first and second input of said flip-flop respectively, the first inputs of said third and fourth AND circuits being connected to the first and the second outputs of said flip-flop, the second inputs of said third and fourth AND circuits being combined, the outputs of said third and fourth AND circuits being connected to the inputs of said phase shifter;

a welder control unit;

a programmer including a welding current pulsation frequency pick-up having an input connected to the secondary winding of said current transformer; a program halt unit comprising a second OR circuit, having a first and a second input, and an output, the first input of said second OR circuit being connected to the output of said welding current pulsation frequency pick-up, and a fifth AND circuit having a first and a second input and an output, said first input being connected to the output of said second OR circuit, and the second input being connected to the output of said pulse shaper;

a pulse counter having an information input connected to the output of said fifth AND circuit and an output;

a decoder having an input connected to the output of said pulse counter, and an output;

a program selector unit having an input connected to the output of said decoder, and first and a second output;

a sixth AND circuit having a first input connected to the combined first inputs of said first and second AND circuits, a second input adapted to receive "weld-on" signals, and an output;

a "weld-on" flip-flop having a first input connected to the first output of said program selector unit, a second input connected to the output of said sixth AND circuit, and an output connected to a control input of said pulse counter and to the second input of said third and fourth AND circuits, and

an output flip-flop unit having a first input connected to the second output of said program selector unit, a second input connected to the output of said "weld-on" flip-flop, and a plurality of outputs, one of said plurality of outputs

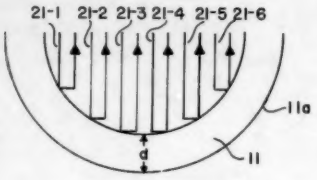
being connected to the second input of said second OR circuit; another output connected to the second input of the first OR circuit.

4,415,794

LASER SCANNING METHOD FOR ANNEALING, GLASS FLOW AND RELATED PROCESSES

Michelangelo Delfino, Mountain View, and Timothy Reifsteck, Cupertino, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 16, 1981, Ser. No. 244,395
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LM **5 Claims**



1. The method of laser scanning a semiconductor wafer which comprises the steps of:

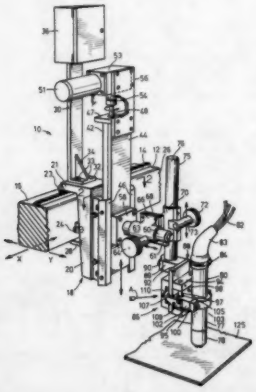
directing the beam from the laser across the top surface of the wafer in a selected pattern while at the same time preventing the laser beam from coming within a selected distance, d, of the edge of the wafer.

4,415,795

TORCH SUPPORT AND HEIGHT SENSOR APPARATUS FOR SHAPE CUTTING MACHINES

John W. Ross, and Pertti T. Raty, both of Toronto, Canada, assignors to Union Carbide Canada Limited, Toronto, Canada

Filed May 12, 1981, Ser. No. 262,835
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 PH **11 Claims**



1. In a cutting apparatus having a torch-support member, a plate sensing member supported from said torch-support member, a first means for moving the torch-support member towards and away from an underlying metal plate, a second means for moving the torch-support member horizontally so that a torch supported from said torch-support member can make a desired cut in the metal plate, the improvement which comprises in combination:

(a) mounting means mounting the plate-sensing member to the torch-support member in a manner which allows relative movement between the plate-sensing member and the support member,

(b) means for establishing a first position of the plate-sensing member with respect to the torch-support member and wherein said plate sensing member comprises the cutting torch itself,

(c) detecting means for generating a signal upon detecting a predetermined degree of relative movement of the plate-sensing member from said first position said detecting means comprising an electrical switch which is triggered by relative movement between the frame and the carriage,

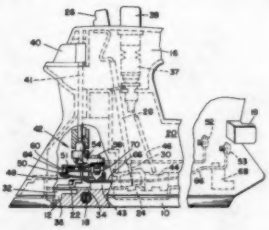
(d) and means for communicating said signal to said first means for reversing the direction of movement of said torch support member.

4,415,796

ELECTRIC IRON WITH UNITARY THERMOSTAT AND OVERTEMPERATURE CONTROL ASSEMBLY

Charles A. Balchunas, Bethany, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,321
Int. Cl.³ H05B *1/02*; H01H *37/76*; G03D *23/08*
U.S. Cl. 219—253 **10 Claims**



1. In an adjustable stacked thermostat assembly including a lower heat deformable blade, a conductive intermediate stiff spring blade connected to one electric terminal, a conductive upper less stiff spring blade connected to a separate terminal, with all blades supported, secured, and spaced apart at one end by interposed insulators, and electrical contacts on said conductive blades with means transmitting movement between the heat deformable blade to said upper blade to make and break an electric circuit and control heat to a medium sensed by said thermostat, the improvement of an overtemperature control means as part of and adjacent said stacked assembly comprising,

a downwardly biased horizontally extending conductive bus bar parallel and adjacent to said heat deformable blade in said assembly and secured to said one electric terminal,

a conducting finger connected to said separate terminal through said electrical contacts and projecting from said adjacent stack substantially at right angles to and overlapping the bus bar,

an insulator between and separating the finger and bar,

a fusible pellet carried by the insulator and cooperating with said finger and said bar to establish an electric circuit therebetween and,

stop means on said insulator disposed to limit downward bar movement,

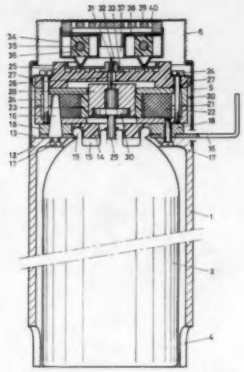
whereby on melting of the pellet, the downwardly biased bar drops and abuts said insulator stop means breaking the circuit established between said bar and finger for fast heat response.

4,415,797

APPARATUS FOR DISPENSING A MATERIAL INTO THE ATMOSPHERE

Nikitas Choustoulakis, 181 Imittou St., Athens 502, Greece

Filed Apr. 15, 1981, Ser. No. 254,564
Claims priority, application Greece, Apr. 19, 1980, 61716
Int. Cl.³ B05B 1/24
U.S. Cl. 219—273 12 Claims



1. An apparatus for electrically dispensing a material to the atmosphere by evaporation of said material, comprising a case for receiving a container holding said material, locking means for releasably securing said container in said case, an electrically controlled actuator assembly in said case adapted to be releasably coupled to said container for causing a quantity of said material to emerge from said container at selectable time intervals and during preset periods, said actuator assembly comprising a ring-shaped solenoid surrounding a plunger connectable to an outlet of said container, and electrical control means connected to said solenoid of said actuator assembly for supplying energizing current to said solenoid including means for selecting said time intervals and means for presetting said periods, characterized in that said plunger (28) has an axial bore receiving a shaft tube (29), one end of which is provided with a nozzle tube (31), and in that there is provided an electrical heating assembly (34,39) comprising an electrically heated body (34) having a bore (37) coaxially aligned with said nozzle tube (31), a heating surface substantially perpendicular to said bore (37) at the side of said body (34) away from said nozzle tube (31), and a plate (39) releasably resting on said heating surface in thermal contact therewith and at least partially covering said bore (37), said plate (39) having a plurality of holes (40) therein.

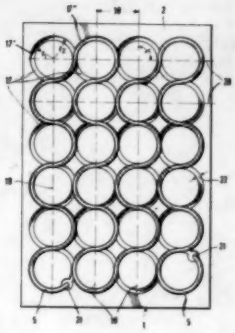
4,415,798

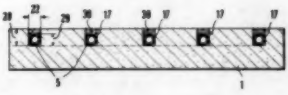
PLATE FOR RADIANT HEATING OR SIMILAR EFFECTS

Horst Knappe, Nuremberg, Fed. Rep. of Germany, assignor to Ilona Knappe, Walldorf, Fed. Rep. of Germany

Filed Sep. 16, 1980, Ser. No. 187,681
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937498; Sep. 2, 1980, 3032968
Int. Cl.³ H05B 3/26
U.S. Cl. 219—345 8 Claims

1. A radiant heater comprising a plate of natural occurring stone as distinguished from cast or man-made compositions such as concrete, groove means machined into an outer surface of said stone plate, said groove means comprising a plurality of 360 degree endless circular groove elements machined into said outer surface of said stone plate, said plurality of 360 degree groove elements each having at least one circular portion thereof coincident with another circular portion of a juxtaposed 360 degree groove element such that said coincident circular portion interconnects said juxtaposed 360 degree groove elements, each of said 360 degree groove elements thereby having a coincident circular portion and a non-coincident circular portion, and heating element means disposed in and extending alternatively from a non-coincident portion to a coincident portion such that at least a section of the heating element extends along a non-coincident portion of one 360 degree groove element to a coincident portion between said one 360 degree groove element and a second 360 degree groove element to the non-coincident portion of said second 360 degree groove element to a coincident portion between said second 360 degree groove element and a third 360 degree groove element to the non-coincident portion of said third 360 degree groove element in an undulating and non-linear manner, whereby said heating element means heats said stone to form the radiant heater.





4,415,799

MULTI-FUNCTION OVEN WITH CONTROL CIRCUIT FOR OPERATION DURING FERMENTATION OF YEAST CONTAINING PRODUCT

Junzo Tanaka, Fujiidera; Toshio Kai, and Yoshitomo Fujitani, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP80/00166, § 371 Date Feb. 11, 1981, § 102(e) Date Feb. 11, 1981, PCT Pub. No. WO81/00341, PCT Pub. Date Feb. 19, 1981
PCT Filed Jul. 22, 1980, Ser. No. 237,159
Claims priority, application Japan, Jul. 27, 1979, 54-96499; Jul. 31, 1979, 54-98224
Int. Cl.³ A21C 13/00; H05B 6/80
U.S. Cl. 219—400 4 Claims

1. A multi-function oven for carrying out yeast fermentation, comprising:

an oven body having a heating chamber therein for receiving articles to be cooked;

an electric resistance type heater outside said heating chamber

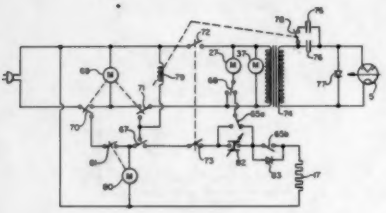
for increasing the temperature in said heating chamber, a partition separating said heating chamber from the space where said heater is located, said partition plate having a plurality of ventilating holes therein;

fan means for circulating the air from said heating chamber over said heater and back into said heating chamber;

means for supplying electric power to said heater and to said fan means;

temperature detecting means in said heating chamber; and

temperature control means to which said temperature detecting means is connected and which is in turn connected to said electric power supply means and including temperature setting means settable to a fermentation temperature for setting said temperature control means to a first control condition and settable to a temperature other than a fermentation temperature for setting said temperature control means to a second control condition, said temperature con-



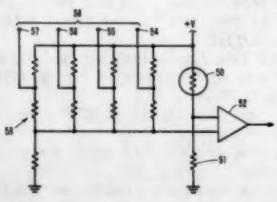
trol means having means for, when set to said first control condition, controlling the electric power supply to said heater and to said fan means in response to a yeast fermentation temperature in said heating chamber for intermittently supplying power to said heater and to said fan means for keeping the temperature in the heating chamber at yeast fermentation temperature for fermentation of yeast in articles in said heating chamber, and when set to said second control condition, controlling the electric power supply to said heater and to said fan means in response to the temperature in said heating chamber for intermittently supplying power only to said heater and supplying constant power to said fan means for keeping the temperature in said heating chamber at the temperature other than that suitable for yeast fermentation, said control means further having means for, when said control means is in said first control condition, causing said fan means to continue running for a predetermined period of time after deenergization of said heater.

4,415,800

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING HEATED FUSERS FOR COPIERS

John H. Dodge, Thornton, and Larry M. Ernst, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,435
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—497 **4 Claims**



1. In a copier having means for providing signals indicative of the temperature of the fuser rollers, the process for minimizing warm-up time for the copier following application of operating power of regularly occurring cycles to the copier comprising the steps of:

comparing the temperature indicative signals against a reference level for a plurality of predetermined, sequential time intervals each of which has a duration corresponding to the time span of a multiplicity of said regularly occurring cycles of power and wherein the said reference level employed for each successive time interval after the initial time interval is lower than the said reference level employed during the immediately preceding said time interval; and

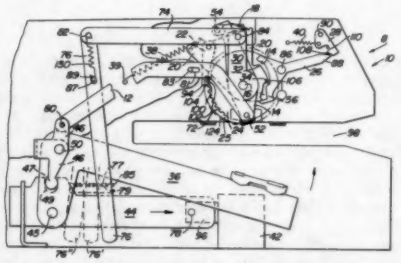
responding to a comparing step wherein said temperature indicative signal is equal to or greater than the said reference level during any said time interval by enabling said copier to perform normal copy processing.

4,415,801

PRINTER COUNTWHEEL MECHANISM

George Franke, Amherst, N.H., assignor to Simplex Time Recorder Co., Gardner, Mass.

Filed Apr. 8, 1981, Ser. No. 252,499
Int. Cl.³ G07G *1/00*
U.S. Cl. 235—101 **11 Claims**



1. Apparatus for maintaining a count of print operations performed by a printing mechanism and for printing the count, comprisng:

(a) counting means having indicia representative of consecutive numbers, said counting means being displaceable with respec to a preselected position at which at least one of said indicia is impacted by the printing mechanism;

(b) means for displacing said counting means after a selectable number of said print operations such that consecutive indicia move into alignment with said preselected position after said selectable number of print operations is completed;

(c) means operatively associated with said means for displacing said counting means for preselecting said number of print operations;

(d) means for causing the printing mechanism to impact the indicia aligned at the preselected position during each print operation.

4,415,802

CROSS IDENTIFICATION SYSTEM AND LOCK

George R. Long, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

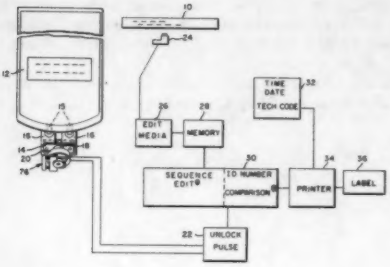
Continuation of Ser. No. 289,116, Aug. 3, 1981, abandoned. This application Jan. 27, 1983, Ser. No. 461,478
Int. Cl.³ G06K *5/00*
U.S. Cl. 235—382 **13 Claims**

1. In a system for insuring the positive cross identification between medicaments and patient, said patient having a first identification member with identification characters imprinted thereon that are both man and machine readable, medicaments

having a second identification member with identification characters imprinted thereon that are both man and machine readable, and an optical character reader for scanning both of the identification members, the improvement comprising,

a lockable container for said medicaments,

a lock for said container,



a comparator coupled to said optical character reader for comparing the identification characters on the first and second members, and

releasing means responsive to said comparator for releasing said lock when the identification characters correspond.

4,415,803

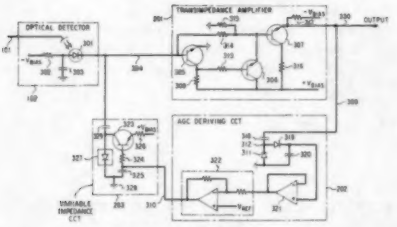
OPTICAL RECEIVER WITH IMPROVED DYNAMIC RANGE

Tran V. Muoi, Ocean, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 199,558, Oct. 22, 1980, abandoned. This application Nov. 18, 1982, Ser. No. 442,570

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—214 A **6 Claims**



1. An optical receiver circuit for an incoming optical signal having a variable power level and a modulation bandwidth, said circuit comprising

an optical detector for receiving said optical signal and generating a current therefrom on a substantially resistance-free path, said current varying with the optical signal power level,

a transimpedance amplifier having an input impedance and an input terminal continuously at virtual ground which is connected to said path, said amplifier transforming said current to an output voltage,

means for generating a control signal which varies in response to said amplifier output voltage,

second means connected between said input terminal and a reference potential for maintaining said amplifier output voltge at a predetermined amplitude over said modulation bandwidth by producing an impedance which varies in response to said control signal, the impedance of said second means being substantially greater than that of said amplifier when said amplifier output voltage is less than a preselected threshold so that said second means is effectively removed from said receiver circuit, said second means shunting a portion of said current away from said amplifier when said amplifier output voltage is greater than said threshold.

4,415,804

ANNIHILATION RADIATION ANALYSIS

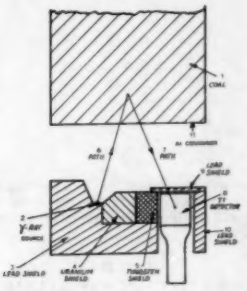
Brian D. Sowerby, Kareela, Australia, assignor to Australian Atomic Energy Commission, Lucas Hights, Australia

Filed Dec. 4, 1980, Ser. No. 213,149

Claims priority, application Australia, Dec. 20, 1979, PE1797

Int. Cl.³ G01V *5/00*; G01N *23/06*

U.S. Cl. 250—255 **21 Claims**



1. Apparatus for quantitatively measuring the concentration of at least a first element, selected from an elemental group consisting of elements having substantially similar atomic numbers, in a matrix comprising other elements having substantialy different atomic numbers to those of said elemental group, which apparatus comprises

(i) a source yielding γ-rays, of sufficient energy for pair production;

(ii) detecting means being associated with said source for detecting 0,511 MeV annihilation radiation;

(iii) first measuring means for making a measurement indicative of bulk density;

(iv) shielding means interposed between said source and said detecting means thereby reducing the intensity of direct source γ-rays impinging on said detecting means; and

(v) calculating means associated with the outputs of said detecting means and said measuring means to calculate said concentration; and wherein said first measuring means is located so as to make said measurement indicative of bulk density over substantially the same volume of said matrix as that in which said annihilation radiation originates.

4,415,805

METHOD AND APPARATUS FOR EVALUATING MULTIPLE STAGE FRACTURING OR EARTH FORMATIONS SURROUNDING A BOREHOLE

Walter H. Fertl, and Donald W. Oliver, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 18, 1981, Ser. No. 274,960

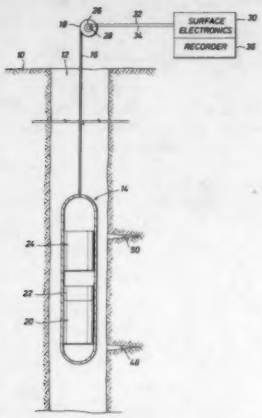
Int. Cl.³ G01V *5/00*

U.S. Cl. 250—260 **8 Claims**

1. A method for evaluating the artificial fracturing of earth formations traversed by a borehole, comprising the steps of:

successively delivering into said borehole a fracture fluid, each successive delivery containing a radioactive tracer element having a unique gamma radiation energy characteristic;

traversing said borehole with a gamma ray detector system; and



selectively measuring radiations having energies characteristic of each of said tracer elements, said measurements indicating the profile of said artificial fracturing.

4,415,806

RADIATION DETECTOR FOR A FLAME ALARM

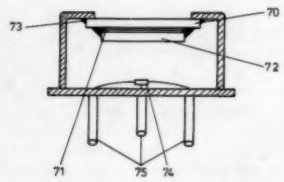
Domokis Tar, Stäfa, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

Division of Ser. No. 31,431, Apr. 19, 1979, Pat. No. 4,280,058. This application Mar. 30, 1981, Ser. No. 249,111

Claims priority, application Switzerland, Apr. 25, 1978, 466/78

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—339 **10 Claims**



1. A radiation detector for a flame alarm comprising:

a sensor element;

a filter arranged forwardly of said sensor element; and

said filter comprising a quartz filter element and a germanium filter element.

4,415,807

CROSS-SLICE DATA ACQUISITION SYSTEM FOR PET SCANNER

Walter S. Frisuf; Rodney A. Brooks, both of Bethesda; Horace E. Cascio, Olney, and Victor Sank, Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 3, 1981, Ser. No. 250,840

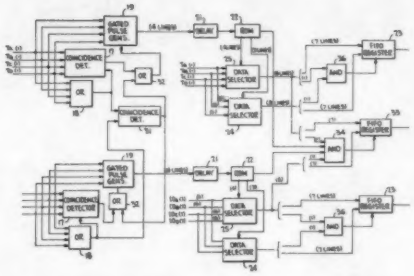
Int. Cl.³ G01T *1/20*

U.S. Cl. 250—363 S **7 Claims**

1. A positron emission tomography scanner of a type wherein at least two planar arrays of photon detectors are each subdivided into sections of sequential detectors, and wherein reception of a photon by a receiving detector results in generation of a timing pulse designating the section in which the receiving detector is located and an identification signal coded to identify that receiving detector, the improvement comprising:

first coincidence detection means for each array for providing a first signal in response to substantially time-coincident generation of two of said timing pulses resulting from reception of photons at two respective receiving detectors designating different sections of one array of said two arrays;

second coincidence detection means in common to said two arrays for providing a second signal in response to substantially time-coincident generation of two of said timing pulses designating sections in said two arrays;



first, second and third register means;

first array processing means responsive to said first signal from one of said arrays for storing the identification signal for the two receiving detectors of said one array in said first register means;

second array means responsive to said first signal from the other array of said two arrays for storing the identification signal for the two receiving detectors of said other array in said second register means; and

means responsive to said second signal for storing the identification signal from the two receiving detectors of said two arrays in said third register means.

4,415,808

SCINTILLATION DETECTOR ARRAY EMPLOYING ZIG-ZAG PLATES

Dominic A. Cusano, Schenectady, N.Y., and Frank A. DiBianca, Mukwonago, Wis., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 219,671, Dec. 24, 1980, abandoned. This application Feb. 9, 1983, Ser. No. 465,086

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—367 **12 Claims**

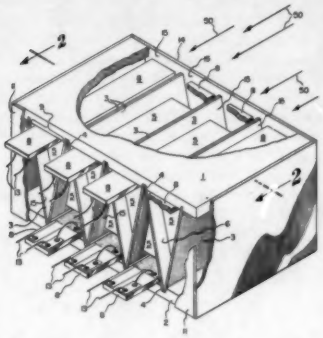
1. A scintillation detector array for use in computerized tomography apparatus comprising:

a housing having a front wall section substantially transparent to x-ray radiation and a rear wall section;

a plurality of adjacent triangular prism shaped chambers disposed within said housing such that said chambers are defined, at least in part, by a plurality of side wall members which are disposed orthogonally to said x-ray transparent front wall section and which are opaque to x-ray radiation, said chambers having alternate, oppositely disposed bases, a plurality of said chambers containing a scintillation medium; and

a photodetector positioned on the base of each of said cham-

bers to detect optical wavelength photons generated by x-rays exciting said scintillation medium after passing



through said substantially x-ray transparent front wall section.

4,415,809

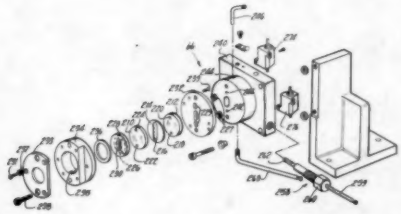
ELECTRO-OPTICAL ANALYZER FOR MEASURING PERCENTAGE BY WEIGHT OF FAT, PROTEIN AND LACTOSE IN MILK

John Shields, 23 North La., Wheldrake Nr. York, England

Division of Ser. No. 84,662, Oct. 15, 1979, Pat. No. 4,310,763. This application Aug. 3, 1981, Ser. No. 289,155

Int. Cl.³ G01N *21/01*

U.S. Cl. 250—432 R **9 Claims**



1. A sample cell for use in optically analyzing fluids comprising a pair of flat parallel optical windows and means spacing said windows from each other to provide a generally planar sample zone, fluid inlet and outlet ports including openings extending through one of said windows and spaced from each other such that fluid entering said inlet port traverses said zone between said windows before exiting said outlet port, a fluid passage extending past said inlet port and connecting with said inlet port through an opening in a side wall of said passage, and a filter medium carried within said passage against said passage side wall across said opening such that fluid which enters said zone through said inlet port is filtered by said filter medium while fluid passing through said passage past said inlet port tends to wash said filter medium.

4,415,810

DEVICE FOR IMAGING PENETRATING RADIATION

Robert L. Brown, Sr., 4805 Rutledge Dr. NW, Huntsville, Ala. 35805

Filed Jul. 5, 1979, Ser. No. 54,777

Int. Cl.³ H05B *33/00*; G01T *1/20*

U.S. Cl. 250—484.1 **7 Claims**

1. A device for imaging penetrating radiation comprising fiber optic tube means including an inner core material composed of scintillating material capable of converting radiation to light rays; a cladding transparent material, about said inner core and reflecting light back into said inner core; an outer most radial light absorbing layer that has a highly colored material suspended therein which absorbs unwanted light that cannot be guided to an exit end of said inner core material; a multiplicity of said fiber optic tube means that are made of the same materials being contiguously disposed relative to each other and secured together to define a disk with an input end face on one side of said disk and an output end face on the other

side of said disk; and said input end face being a polished surface and having attached thereto a thin, corrosion resistant, metallic, mirror coat, said mirror coat being attached such as by being deposited thereon chemically or by vacuum techniques to provide a thin mirror coat of a thickness that is from about 1 to about 20 millionths of an inch thick that is opaque to stray light outside said fiber optic tube means, and that is reflective to light quanta from scintillations within said fiber optic tube means and thereby improve light output capability of each of said fiber optic tube means.

4,415,811

OPTICAL SCANNING APPARATUS

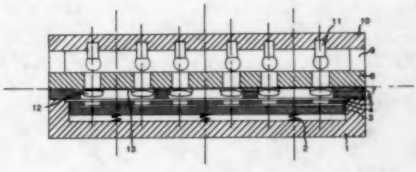
Jürgen Beck, Cologne, and Herbert Röhrig, Berg-Gladbach, both of Fed. Rep. of Germany, assignors to Dr. Madaus & Co., Cologne, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 296,045

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032334

Int. Cl.³ G01B *11/02*; G01N *21/86*

U.S. Cl. 250—560 **9 Claims**



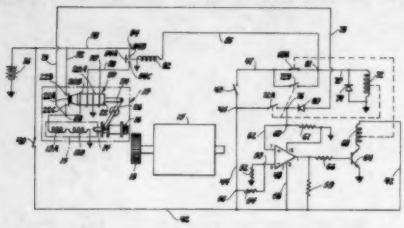
1. In an apparatus for the optical scanning of objects in which the light from at least one light source may fall on at least one light-sensitive sensor and the objects to be scanned are disposed between the light source and the sensor, the improvement comprising an aperture mask having an aperture for each object to be scanned conforming to the contours the objects should have and disposed between the sensor and the objects to be scanned, the sensor comprising at least one large-area solar cell having an area at least as large as one of the apertures.

4,415,812

ELECTRIC STARTING SYSTEM

Donald B. Griffith, Markleville, and Timothy C. Alexander, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1982, Ser. No. 338,639
Int. Cl.³ B23K 9/10; B60K 15/00; H02P 9/04; F02N 11/08
U.S. Cl. 290—38 R 5 Claims



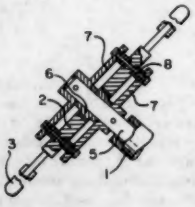
1. An electric starting system for cranking an engine comprising, an electric cranking motor, a voltage source, a start switch, cranking motor control means including a switching means operative in a first state to permit initial energization of the cranking motor from the voltage source when the start switch is initially closed and operative in a second state to prevent subsequent energization of the cranking motor from the voltage source when the start switch is subsequently opened and then reclosed, voltage responsive means coupled to said switching means for controlling its state of operation, means responsive to initial closure of said start switch for energizing said cranking motor and for applying a voltage to said voltage responsive means from said voltage source of such a magnitude as to cause said voltage responsive means to actuate said switching means from said first state to said second state, means disconnecting said cranking motor and voltage source when said start switch is subsequently opened, and means for applying the voltage generated in said cranking motor to said voltage responsive means when said cranking motor is disconnected from said voltage source, the magnitude of the generated voltage being such as to cause the voltage responsive means to maintain the switching means in said second state to prevent energization of the cranking motor until said generated voltage decreases to a predetermined value.

4,415,813

AEROGENERATOR HAVING A CONTROLLED AXIS OF ORIENTATION

Anne M. Carme, Castres, France, assignor to AEROPOWER Sarl, Montgiscard, France

Filed Jan. 16, 1981, Ser. No. 225,806
Claims priority, application France, Jan. 16, 1980, 80 01160
Int. Cl.³ F01D 7/02; F03D 7/04; H02P 9/04
U.S. Cl. 290—44 16 Claims



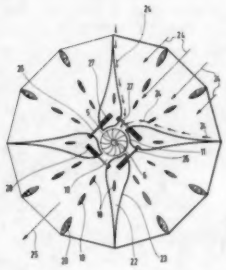
1. An aerogenerator comprising:
(a) a rotor having at least one blade;
(b) a cap in which said rotor is journalled;
(c) hydraulic shock absorbers cooperating with said cap and positioned along opposite sides of an axis on which said rotor is journalled, said axis having a variable orientation;
(d) a swivel joint positioned between said rotor and said axis;
(e) two circular walls positioned on opposite sides of said rotor and being connected by said hydraulic shock absorbers;
(f) a deformable quadrilateral structure attached to said axis, said quadrilateral structure comprising a first connecting rod, a second connecting rod having a length different than the length of said first connecting rod, a lower plate adapted to rotate about a vertical line, and an upper plate adapted to carry said rotor and said generator.

4,415,814

SYSTEM FOR THE GENERATION OF ELECTRICAL ENERGY BY UTILIZING AND CONTROLLING WIND ENERGY

José Martinez Parra, Calle Salitre 33-1°, Edificio Juan XXIII, Cartagena (Murcia), Spain

Filed Jul. 23, 1981, Ser. No. 286,188
Claims priority, application Spain, Sep. 25, 1980, 495343
Int. Cl.³ F03D 7/06
U.S. Cl. 290—55 3 Claims

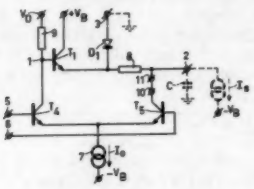


1. A system for the generation of electrical energy by utilizing and controlling wind energy, which comprises a domed building (3) on which an impeller (5) is mounted, the axis of said impeller penetrating the domed building at its highest point and transmitting the motion of the impeller to an installation for converting the kinetic energy of the impeller into electrical energy, a superstructure located around and above the domed building and the impeller, the superstructure consists of pillars (18, 19, 20), a roof construction (21) and supports (22), the supports are straight in a vertical sense and, divide the superstructure into several sectors, represent at the outer circumference of the superstructure a single wall which towards the center of the superstructure divides into two walls which reunite in front of the impeller located in the center of the superstructure, thus defining a central chamber in which the impeller is located, the vertical walls of the supports are differently curved so that they lead and concentrate the wind onto the concave surfaces of the impeller, and closing means for the aperture between the surface of the domed building, the opposing vertical walls (23) of two supports and the roof construction being located at the access to the chamber in which the impeller is located, said closing means consisting of sliding gates movable in the horizontal direction and the supports are provided with slots, said gates sliding into said slots when they are opened.

4,415,815
ELECTRONIC SWITCH

Eise C. Dijkmans, and Rudy J. Van de Plassche, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 135,967, Mar. 31, 1980, abandoned.
This application Feb. 23, 1982, Ser. No. 351,573
Claims priority, application Netherlands, Apr. 4, 1979, 7902633
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—243 **7 Claims**



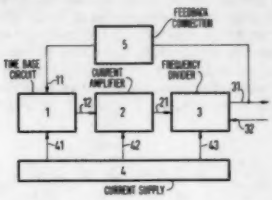
1. An electronic switch comprising a signal input, a signal output and a switching input, a first transistor having an emitter electrode connected to the signal input, a base electrode coupled to the switching input for selectively turning the first transistor on and off, and a collector electrode connected to a current sink, a switching element comprising a rectifying semiconductor junction connected between the signal input and the signal output for conducting a current applied to the signal input when the first transistor is cut off, means coupling the switching element to a point of constant potential so that, during conduction of said switching element in response to turn-off of the first transistor, a first predetermined potential appears at the emitter electrode of the first transistor, whereas during non-conduction of said switching element in response to turn-on of the first transistor, a second predetermined potential appears at the emitter electrode of the first transistor, means connecting a first resistor between the signal input and a connecting point of the emitter electrode of the first transistor and the switching element, means connecting the signal input to a current source switched in synchronism with the first transistor so that the source supplies an additional current during conduction of the first transistor wich flows via the first resistor and the first transistor to the signal input, said current producing a voltage drop across the first resistor that substantially compensates for the difference between said first and second potentials.

4,415,816
MONOLITHICALLY INTEGRATED CIRCUIT FOR THE PRODUCTION OF LONG PULSES

Ruediger Mueller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1977, Ser. No. 833,556
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 26419158
Int. Cl.³ H03K *3/017, 5/04*
U.S. Cl. 307—265 **2 Claims**

1. A monolithically integrated circuit for the production of pulses, comprising:
- a time base circuit comprising a ring oscillator and means responsive to electromagnetic radiation to supply current to said time base circuit;
- a current amplifier;
- a first line connecting said time base circuit to said current amplifier;
- a frequency divider having an output for emitting pulses;
- said time base circuit, said current amplifier and said frequency divider each constructed in the I^2L technique and comprising I^2L circuits including I^2L inverters and I^2L gates;
- a second line connecting said current amplifier to said frequency divider;
- a current supply;

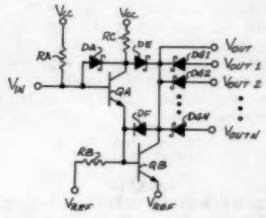


- a third line connecting said current supply to said current amplifier; and
- a fourth line connecting said current supply to said frequency divider.

4,415,817
BIPOLAR LOGIC GATE INCLUDING CIRCUITRY TO PREVENT TURN-OFF AND DEEP SATURATION OF PULL-DOWN TRANSISTOR

Thomas D. Fletcher, Provo, Utah, assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 8, 1981, Ser. No. 309,756
Int. Cl.³ H03K *17/04, 17/62, 19/088, 19/084*
U.S. Cl. 307—454 **18 Claims**



1. A logic circuit having: a first bipolar transistor having a base for receiving an input signal, an emitter, and a collector coupled to a voltage/current source; and a second bipolar transistor having a base coupled to the emitter of the first transistor, an emitter coupled to a constant voltage source, and a collector coupled to the voltage/current source for supplying an output signal; characterized by plural means for preventing the second transistor from either turning substantially off or normally going into deep saturation.

4,415,818
PROGRAMMABLE SEQUENTIAL LOGIC CIRCUIT DEVICES

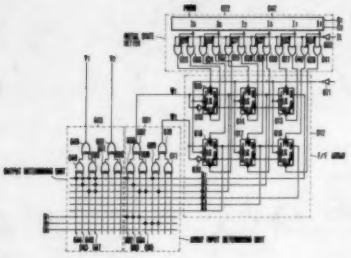
Katsuhiko Ogawa, Yokohama, and Shinju Horiguchi, Yokosuka, both of Japan, assignors to Nippon Telegraph & Telephone Corp., Japan

Filed Jan. 7, 1980, Ser. No. 110,030
Claims priority, application Japan, Jan. 16, 1979, 54/3597; Feb. 6, 1979, 54/12461
Int. Cl.³ H03K *19/177*
U.S. Cl. 307—465 **5 Claims**

1. A programmable sequential logic circuit device comprising:
- a first logic array for producing product terms of a first and second plurality of input signals;
- a second logic array having inputs coupled to said first logic array for producing sum terms of the outputs of said first

logic array, said second logic array including output terminal means for manifesting sequential signals to an associated circuit;

a two-dimensional array of flip-flop circuits having a plurality of rows of stages, each stage including a plurality of serially connected flip-flop circuits, said array of flip-flop circuits further including a first input terminal group connected to outputs of said second logic array for supplying sum term signals to the inputs of respective rows of stages, a second input terminal group connected to inputs of the respective stages other than said row inputs for receiving an external control signal for setting an internal



state of the array of flip-flop circuits, and output terminals connected to said first logic array for supplying state signals thereto as said first plurality of input signals; and

setting means connected to said second input terminal group for generating said external control signals for setting the initial internal state of said array of flip-flop circuits and for changing said internal state for permitting an interruption during the operation of said array of flip-flop circuits, whereby said device generates said sequential signals for said associated circuit in accordance with the second plurality of input signals applied to said first logic array and the present internal state of said array of flip-flop circuits.

4,415,819

DYNAMIC MOS-LOGIC IN INTERLACE-TECHNIQUES

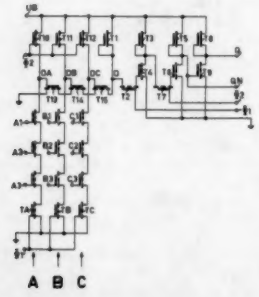
Egon Mathes, Elmshorn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1981, Ser. No. 223,198

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001389

Int. Cl.³ H03K *19/017, 19/096, 19/20*

U.S. Cl. 307—481 **1 Claim**



1. An integrated digital circuit arrangement with MOS field-effect transistors, which arrangement comprises a combinatorial circuit for applying a logic operation to a plurality of input signals, which combinatorial circuit comprises a plurality of branches, there being provided means for applying said input signals as well as an output, which is coupled to a first node of the arrangement, whose potential at a specific instant is representative of the result of the logic operation and depends on whether the capacitance of the first node is charged or not, characterized in that:

each branch is provided with a pre-charging transistor while for isolating the individual branches from each other there is provided a transistor arranged as a transfer gate for each branch, whose gate-electrode is connected to the relevant branch, the source and drain electrodes of said transistors arranged as a transfer gate being included in series between a common reference point and the first node, wherein the charging time of said first node capacitance is essentially independent of the number of transistors in said transfer gate and said charging time occurs prior to said specific instant.

4,415,820

TRANSISTOR DIFFERENTIAL CIRCUIT WITH EXPONENTIAL TRANSFER CHARACTERISTIC

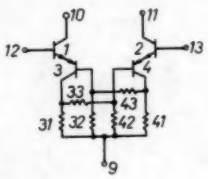
Urs Zogg, Rümlang, Switzerland, assignor to Willi Studer, Fabrik fuer elektronische Apparate, Regensdorf, Switzerland

Filed Feb. 23, 1981, Ser. No. 237,105

Claims priority, application Switzerland, Mar. 19, 1980, 2171/80

Int. Cl.³ H03K *5/08, 17/00, 3/26*

U.S. Cl. 307—491 **8 Claims**



1. Transistor differential circuit having two cross-connected transistors, said transistors being characterized by having a base-voltage-difference to collector current relationship which is exponential, comprising

two branches, each branch including a first transistor (**1, 2; 5, 6**) of a first conductivity type (NPN) and, serially connected with the collector-emitter path thereof, a second transistor (**3, 4; 7, 8**) of opposite conductivity type (PNP), and passive resistive network means (**31, 32, 33; 41, 42, 43; 71, 81**) connected to one of said transistors in each branch, said circuit means being dimensioned to compensate for voltage drops resulting from inherent or bulk resistances of the semiconductor material of the first and second transistors arising in the respective branches.

4,415,821

DYNAMIC MAGNETIC PRELOAD BEARING STRUCTURE FOR A LINEAR MOTOR

Leonard N. Wedman, Radford, Va., and Joseph A. Bourque, Saratoga, Calif., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed May 10, 1982, Ser. No. 376,655

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—12 **11 Claims**

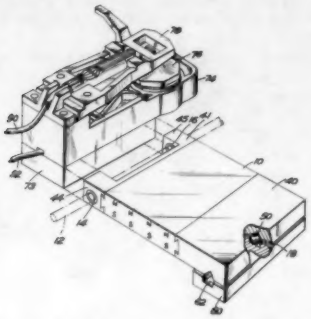
1. In a linear motor the combination of:

an electromagnetic stator winding;

a permanent magnet linearly movable in accordance with energization of said stator winding;

a linearly movable carriage, said permanent magnet being attached thereto;

a guide rod and cooperating linear bearing attached to said carriage to confine movement of said carriage along a linear path;



a ball bearing disposed to prevent rotation of said carriage about said guide rod; and

said permanent magnet being so located that said carriage is urged towards said ball bearing.

4,415,822

STATORS OF DYNAMOELECTRIC MACHINES

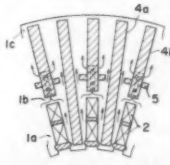
Toshiyuki Aiba, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 23, 1981, Ser. No. 304,906

Claims priority, application Japan, Oct. 3, 1980, 55-140495[U]

Int. Cl.³ H02K *1/20, 9/02*

U.S. Cl. 310—59 **1 Claim**



1. In a stator of a dynamoelectric machine of the type comprising an iron core formed by laminating iron sheets, armature coils received in slots of said iron core, a plurality of spacer blocks extending radially in contact with an end surface of said iron core, said spacer blocks including long spacer blocks extending between an outer periphery of the iron core and teeth portions thereof and short spacer blocks extending between said outer periphery and the bottom portions of said slots, and clamping end plates for axially clamping said iron core, the improvement in which each of said short spacer blocks is provided with a radially extending channel formed on the side surface facing toward the end surface of said iron core, said channel having a gas outlet and an end opened on the side facing to said slot bottom to form an inlet for a cooling gas, each of said short spacer blocks being provided with a groove formed at an intermediate portion thereof and provided with end openings opened to the spaces between said short and long spacer blocks, said channel being terminated at and connected with said groove, and in which buffer boards are provided between the long and short spacer blocks to form a narrow space between said long and short spacer blocks to change gas-flow speed for effectively guiding cooling gas into said inlet and cooling said slot bottom, said buffer boards being disposed between said groove and the end opening of said channel.

4,415,823

GENERATOR FOR THE PRODUCTION OF ELECTRICAL ENERGY

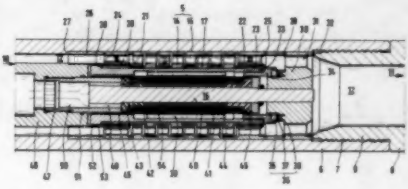
Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Aug. 3, 1981, Ser. No. 289,683

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1980, 3029523

Int. Cl.³ H02K *5/10*

U.S. Cl. 310—87 **9 Claims**



1. Generator for production of electrical energy to supply consumers located inside a bore hole, in particular, consumers for detection, transmission and remote control, where the generator is located in a flushing space inside of a drill string through which flushing liquid flows, which includes a stator and a rotor having a radial space arranged coaxially to the stator said rotor being coupled to a motor which is energized by the flushing liquid, said stator containing a generator armature and said rotor containing an exciter equipped with permanent magnet means, characterized by the fact that said space between stator and rotor is connected with said flushing space, a connecting path is directed counter-current to the direction of the flushing current on the intake side, and that said rotor is supported by means of unsealed, erosion and abrasion-resistant radial and axial bearings.

4,415,824

STATOR CASING FOR AIR-COOLED ELECTRICAL MACHINES

Albert Meier, Waltenschwil, Switzerland, assignor to Zschokke Wartmann AG, Switzerland

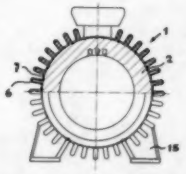
PCT No. PCT/CH79/00063, § 371 Date Jan. 3, 1980, § 102(e) Date Jan. 2, 1980, PCT Pub. No. WO79/01024, PCT Pub. Date Nov. 29, 1979

PCT Filed May 1, 1979, Ser. No. 192,593

Claims priority, application Switzerland, Jul. 3, 1978, 4860/78

Int. Cl.³ H02K *5/00*

U.S. Cl. 310—89 **5 Claims**



1. A stator assembly comprising:

an initialy axially convex sheet metal jacket having an inside diameter near its center which is initially smaller than an inside diameter near the jacket ends, said jacket formed of a plurality of shaped, axially extending, radially projecting and peripherally spaced cooling ribs;

reinforcement means at said jacket end: for preventing an enlargement of diameter of said jacket ends; and

a stator core having an outside diameter substantially the same as said jacket inside diameter at said jacket ends,

press-fit into said jacket and against the center of said jacket to move said center radially outwardly so that said stator core is firmly engaged with said jacket and supported thereon;

said reinforcement means comprising an outer thrust ring and an inner thrust ring connected to each of said jacket ends by welds.

4,415,825

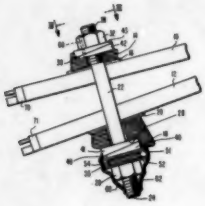
END TURN BRACING WITH LOCKING AND ALIGNMENT DEVICE

George F. Dailey, Plum Borough, and Charles E. Kauric, Manor Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1982, Ser. No. 343,074

Int. Cl.³ H02K *3/46*

U.S. Cl. 310—270 **14 Claims**



1. A fastening device for securing end turns of an electric generator, comprising:

a cylindrical rod threaded at at least one end;

two annular spacers, each of said spacers having two non-parallel planar surfaces with a central hole therethrough, said annular spacers being arranged in a coplanar association with said cylindrical rod extending through the holes of said spacers;

a member with a generally flat surface, said member being disposed in coplanar association with a first external planar surface of one of said two associated annular spacers;

an annular member having a central bore therethrough, said bore being threaded,

said annular member being in threaded association with a threaded end of said cylindrical member, said annular member having a planar surface in coplanar association with a second external planar surface of one of said two associated annular spacers; and

whereby said annular threaded member exerts a force on said second external planar surface and said generally flat surface of said member exerts a force on said first external planar surface, said two annular spacers being compressed between said annular member and said generally flat surface of said member, said two annular spacers being rotatable about said cylindrical member.

4,415,826

SUPPORT AND CONNECTION DEVICE FOR A DISC-SHAPED PIEZOELECTRIC RESONATOR

Hans Kreutzer, and Werner Mattuschka, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,031

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 8120939[U]

Int. Cl.³ H01L *41/00*

U.S. Cl. 310—354 **1 Claim**

1. In combination, a resonator and a support and connection device, comprising

a disc-shaped resonator body;

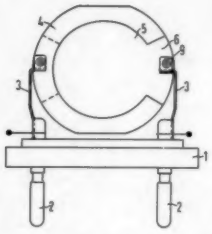
a pair of excitation electrodes carried on opposite surfaces of said body, each of said excitation electrodes having a diameter which is less than that of said body;

a pair of terminal electrodes, each integral with a respective excitation electrode and each extending up to the edge of said body at a location diametrically opposite to that of the other terminal electrode;

a pair of radially-extending slots in said body, each of said slots being in the area of a respective terminal electrode and opening radially outwardly through the edge of said body;

a support plate;

a pair of spaced-apart terminal pins extending through said support plate;



a pair of support elements each comprising electrically conductive spring material, each connected to a respective terminal pin, and each further comprising

a bent section received in a respective slot and including a passageway therethrough, and

a pair of spaced tongues extending away from said plate forming a pocket and clampingly receiving said body in the area of a respective terminal electrode, each of said tongues including an inwardly directed dimple including a passageway therethrough; and

a conductive adhesive in the interstices formed by said body, said pockets and said passageways.

4,415,827

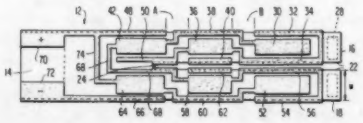
MICRORESONATOR OF TUNING FORK CONFIGURATION OPERATING AT ITS SECOND OVERTONE FREQUENCY

Shih Chuang, Irvine, Calif., assignor to Statek Corporation, Orange, Calif.

Filed May 27, 1981, Ser. No. 267,814

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—370 **24 Claims**



1. An improved, flexural-mode piezoelectric tuning fork, comprising:

a stem portion;

a pair of tines extending from said stem;

a slot between said tines, said slot having a crotch where said tines join said stem; and

electrode means mounted on said tines for causing said fork to oscillate preferentially at its second overtone frequency when oscillating electrical fields are applied to said electrode means and for suppressing fundamental and first overtone components in the oscillations of said fork.

4,415,828

SPARKPLUG WITH ANTIFOULING COATING ON DISCHARGE END OF INSULATOR

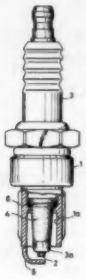
Hisao Mizuno; Shunichi Takagi; Kichio Nakahara, and Takahito Yamamota, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 20, 1981, Ser. No. 285,242

Claims priority, application Japan, Jul. 22, 1980, 55-100143; Jul. 29, 1980, 55-107097[U]

Int. Cl.³ H01T *13/20*

U.S. Cl. 313—118 8 Claims



1. In a sparkplug having good antifouling properties wherein a porcelain insulator for supporting a central electrode is fixed in a metal casing, the improvement wherein a coating of silicone and paraffin is provided on at least a firing surface of said porcelain insulator surrounded by an inner surface of a combustion chamber side of said metal casing, thereby preventing a decrease in electrical resistance.

4,415,829

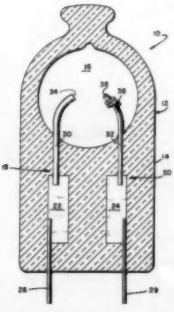
DIRECT CURRENT OPERABLE ARC LAMP

Harold L. Rothwell, Jr., Rowley; George J. English, Reading, and William M. Keeffe, Rockport, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 13, 1981, Ser. No. 292,373

Int. Cl.³ H01J *61/06*

U.S. Cl. 313—621 5 Claims



1. A miniature, single-ended, low-wattage D.C. operable, arc discharge lamp comprising: a glass body having one end formed as a press seal and another end formed to provide an arc chamber; an anode electrode and a cathode electrode each having intermediate portions sealed in said press seal, said electrodes having first ends extending exteriorly of said body and second ends extending into and terminating within said arc chamber, said electrodes being substantially parallel to one another for a major portion of their length and having their terminal ends inclined toward each other to define therebetween an arc gap; said cathode electrode only having, substantially adjacent its terminal end, electrical field modifying means.

4,415,830

INLEAD CONSTRUCTION FOR ELECTRIC LAMP

John W. Pugh, Gates Mills; Francis W. Pikus, Cleveland Heights; James A. Graves, Highland Heights; John E. McMillan, Kirtland, all of Ohio, and John L. Walter, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,073

Int. Cl.³ H01J *5/50*

U.S. Cl. 313—331 10 Claims

1. An inlead material for an electric lamp which comprises an iron alloy containing silicon in an amount from slightly more than about 2 weight percent up to about 4.5 weight percent to avoid allotropic transformation to the gamma austenite phase at lamp operating temperatures.

4,415,831

ELECTROMAGNETIC DEFLECTION TYPE PICTURE TUBE DEVICE

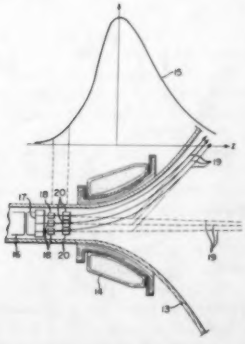
Osamu Konosu, Nagaokakyo, Japan, assignor to Matsushita Electronics Corporation, Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 288,052

Claims priority, application Japan, Aug. 19, 1980, 55-114501

Int. Cl.³ H01J *29/76*

U.S. Cl. 313—413 2 Claims



1. An electromagnetic deflection type picture tube device characterized by the provision of

(a) a first field-control element which is disposed between the electron-beam emission end of an electron gun and a deflection yoke,

comprising a pair of magnetic pieces which are disposed on the opposite sides of the path of an electron beam, and being adapted to produce a local field distortion (a barrel or pincushion distortion) which is opposite to a main distortion (a pincushion or barrel distortion) of the deflection field by introducing the rise portion of the deflection field; and

(b) a second field-control element which is disposed between the electron-beam emission end of the electron gun and said first field-control element,

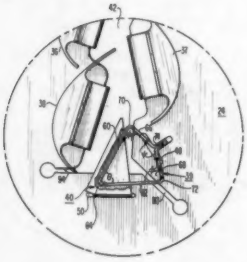
comprising a pair of magnetic pieces which are disposed on the opposite sides of the path of the electron beam, and being adapted to produce a local field distortion (a pincushion or barrel distortion) which is opposite to said local field distortion produced by said first field-control element by introducing the rise portion of said deflection field.

4,415,832

ELECTRON MULTIPLIER HAVING AN IMPROVED PLANAR UTLIMATE DYNODE AND PLANAR ANODE STRUCTURE FOR A PHOTOMULTIPLIER TUBE

Richard D. Faulkner, Lancaster; Dale V. Henry, Willow Street, and David L. Muth, East Petersburg, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,260
Int. Cl.³ H01J *40/00*
U.S. Cl. 313—533 **8 Claims**



1. In a photomultiplier tube having an electron multiplier assembly including insulative support means, a plurality of elements including an ultimate dynode and an anode, said elements being affixed to said support means, the improvement wherein

said ultimate dynode comprises a relatively inflexible multilateral hollow member having two plane-face surfaces lying at an acute angle to one another and terminating at a lower transverse edge, said ultimate dynode including integral dynode mounting means extending from opposing ends thereof for affixing said ultimate dynode to said support means,

said anode including a substantially flat electron permeable mesh portion spaced from one of said plane-face surfaces of said ultimate dynode, said anode having integral anode mounting means extending from opposing ends thereof for affixing said anode to said support means, and

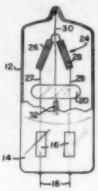
electrical leakage isolation means formed in said support means for increasing the electrical leakage path length across said support means between said ultimate dynode and said anode.

4,415,833

TUNGSTEN HALOGEN LAMP WITH COILED GETTER

James E. Oetken, Winchester, and Jeffrey P. Buschmann, Lexington, both of Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 29, 1981, Ser. No. 306,793
Int. Cl.³ H01K *1/54*
U.S. Cl. 313—559 **8 Claims**



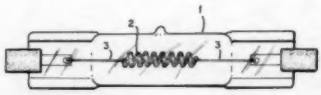
1. In a low wattage tungsten halogen lamp including a hermetically-sealed, light-transmitting envelope, an inert fill and halogen disposed within said envelope, an insulative support bridge located within said envelope, a coiled tungsten filament located within said envelope and supported from said insulative support bridge, a filament support wire secured to and extending from said insulative support bridge for supporting said tungsten filament, and means for gettering impurities within said envelope, the improvement wherein said filament support wire includes an end portion extending from said insulative support bridge on a side opposite said coiled tungsten filament and said means for gettering said impurities within said envelope is in coil form to provide increased surface area for getter absorption, said coil getter secured to said end portion of said filament support wire such that said insulative support bridge is positioned between said coil getter and said tungsten filament.

4,415,834

TUNGSTEN HALOGEN LAMP CONTAINING CYANOGEN

James P. Keenan, Reading, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 8, 1979, Ser. No. 46,897
Int. Cl.³ H01K *0/00*
U.S. Cl. 313—578 **1 Claim**



1. An incandescent lamp comprising a tungsten filament disposed within a lamp envelope, the lamp envelope containing a gaseous filling including cyanogen and a halogen or halide.

4,415,835

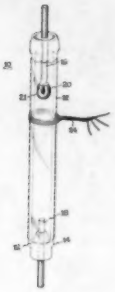
ELECTRON EMISSIVE COATINGS FOR ELECTRIC DISCHARGE DEVICES

Amarendra Mishra, Lyndhurst; Dimitri M. Speros, Painesville, and Roger M. Eastin, South Euclid, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,834
Int. Cl.³ H01J *61/06, 61/16*
U.S. Cl. 313—627 **15 Claims**

1. A cathode member for an electric discharge device which comprises a refractory metal substrate having sintered thereto

an open porous coating of refractory metal particles at a thickness up to about 1 millimeter and with electron emissive material being disposed in the pores of the sintered refractory metal coating.



4,415,836

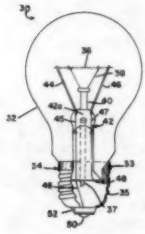
LAMP WITH IMPROVED FUSE WIRE

Robert J. M. De Cuester, Diest; Louis J. M. Hoeben, Hasselt, both of Belgium, and Clair Wood, Brewer, Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 1, 1981, Ser. No. 307,406

Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96, 1/12*

U.S. Cl. 315—50 **12 Claims**



1. In an electric lamp having an hermetically sealed, light-transmitting envelope containing an energizable source of light and having a sealed portion at one end, a base having terminal means and within which said sealed end portion of the envelope is secured, and a plurality of lead-in wires extending through the sealed end portion of said envelope and electrically connecting said light source to the terminal means of said base, the improvement comprising a fuse wire included as at least a portion of one of said lead-in wires, which fuse comprises material selected from the group consisting of a first alloy of 15% to 25% Cr, 70% to 80% Fe and 4.5% to 5% Al and a second alloy of 20% to 25% Cr, 20% to 30% Ni and 45% to 55% Fe.

4,415,837

STARTING CIRCUIT FOR GASEOUS DISCHARGE LAMPS

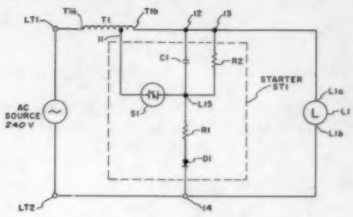
Gregory L. Sodini, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 318,466, Nov. 5, 1981, abandoned. This application Jan. 18, 1982, Ser. No. 340,192

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—177 **7 Claims**

1. A circuit for starting and operating a high intensity discharge lamp having at least two electrodes from a source of alternating current, means coupling said lamp across said source, said coupling means comprising a transformer with its output winding in series with the lamp and a starting network connected at the output end of the transformer output winding, said starting network including a series circuit comprising a capacitive member and a resistance member in series with one another with a junction terminal therebetween, said series circuit connected across the lamp, a voltage sensitive symmetrical switch connected from said junction terminal to an intermediate tap in said transformer output winding to discharge



said capacitive member through the switch and the transformer section between the tap into said transformer output winding and the output end thereof to generate a high voltage charge to said lamp when the voltage across the switch rises above a predetermined threshold starting level for the lamp, and a diode in series with the members of said series circuit for limiting the charging of said capacitive member to unidirectional current flow during alternate half cycles of said alternating current whereby to limit the starting power applied to said lamp.

4,415,838

FREQUENCY CONVERTER FOR SUPPLYING AN ELECTRODELESS DISCHARGE LAMP

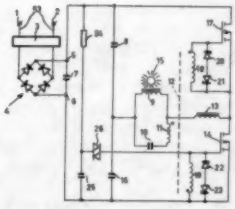
Henk Houkes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,398

Claims priority, application Netherlands, Jul. 21, 1980, 8004175

Int. Cl.³ H05B *41/24*

U.S. Cl. 315—248 **7 Claims**



1. A frequency converter for energizing an electrodeless discharge lamp at a frequency of at least 0.5 MHz comprising, two input terminals adapted to be connected to a direct voltage source, means connecting the two input terminals to a first series arrangement of a power MOS-FET semiconductor switching element having a control electrode, a first coil, and a parallel arrangement of at least a first branch comprising a second coil and a branch comprising at least a capacitor, the second coil being coupled to the discharge path of the lamp in the operating condition of the lamp, a transformer having a primary and a secondary winding, means connecting said secondary winding to the control electrode and to a main electrode of the controlled semiconductor switching element, means connecting the primary winding of the transformer so

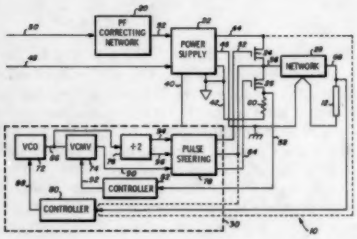
that it forms part of the parallel arrangement, and means connecting a breakdown element in parallel with a winding of the transformer, the transformation ratio of the transformer being sufficiently large so that in the operating condition the voltage across the breakdown element reaches the breakdown value.

4,415,839

ELECTRONIC BALLAST FOR GASEOUS DISCHARGE LAMPS

Ronald A. Lesea, 51 Foss Dr., Redwood City, Calif. 94062

Filed Nov. 23, 1981, Ser. No. 323,676
Int. Cl.³ G05F *1/00*; H05B *37/02*
U.S. Cl. 315—308 **32 Claims**



1. An electronic ballast for energizing a gaseous-discharge lamp and for regulating the power consumed thereby, the ballast comprising in combination:

means for developing a supply of DC power between a pair of outputs and for developing a power-supply-means common;

a pair of transistors connected as switches in series between said pair of power-supply-means outputs, said transistors for selectively coupling to the juncture thereof the potential developed at each of said pair of outputs;

a current-limiting network for energizing the lamp from the potential developed between said transistor juncture and said power-supply-means common; and

means for generating pulses for driving each of said transistors in turn whereby a potential is developed at said transistor juncture which alternates as positive-going and negative-going pulses each separated by a dead time, said pulse generating means for monitoring the power consumption level of said lamp and responsive thereto operative to vary the frequency of said transistor driving pulses whereby said lamp consumption is regulated, said pulse generating means including

control means for developing a signal indicative of said consumption level,

oscillator means for developing a signal having a frequency responsive to said control-means signal,

monostable-multivibrator means triggered by said oscillator-means signal, said monostable-multivibrator means for developing a series of pulses each of predetermined width at said oscillator-means frequency,

dividing means clocked by said oscillator-means signal and operative to develop a bistate signal at half said oscillator-means frequency, and

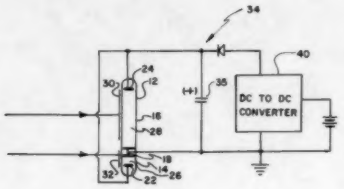
gating means responsive to each pulse of said monostable-multivibrator-means series of pulses and operative to develop a corresponding one of said transistor driving pulses for driving a one of said transistors selected responsive to said dividing-means signal.

4,415,840

COMBINED FLASH TUBE AND QUENCH TUBE APPARATUS

Hans P. A. Baumeister, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,601
Int. Cl.³ H05B *41/34*
U.S. Cl. 315—323 **6 Claims**



1. In a flash discharge apparatus including a light-transmitting envelope, and first and second electrodes disposed respectively at the ends of said envelope, the improvement comprising:

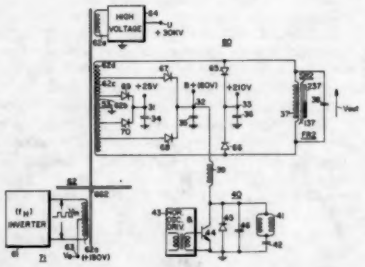
separating means including an intermediate electrode disposed within said envelope between said first and second electrodes for forming (1) a first enclosed chamber containing ionizable gas between said first electrode and said intermediate electrode, and (2) a second enclosed chamber containing ionizable gas between said second electrode and said intermediate electrode, said gas in said first and said second chambers being selected and pressurized respectively to provide a lower impedance for the arc discharge path within said second chamber than the impedance within said first chamber during operation of said discharge apparatus.

4,415,841

TELEVISION RECEIVER FERRORESONANT POWER SUPPLY WITH PERMANENT MAGNET BIASING

Donald H. Willis, and Randall C. Clayburn, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,433
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—400 **31 Claims**



1. A power supply for a television display system including a regulated ultor power supply with reduced ultor voltage temperature dependence, comprising:

a source of input voltage;

means coupled to said source for developing an exciting current;

a magnetizable core including a saturable core section;

a winding located on said core;

means responsive to said exciting current for generating a

magnetic flux in said magnetizable core that links said winding to develop an alternating polarity output voltage;

a capacitance associated with said winding for developing a circulating current that generates a first magnetizing force in said saturable core section;

a permanent magnet for biasing said core so as to produce a second magnetizing force in said saturable core section, the resultant of the two recited magnetizing forces developing a magnetic flux that substantially magnetically saturates said saturable core section for regulating said alternating polarity output voltage;

an ultor terminal; and

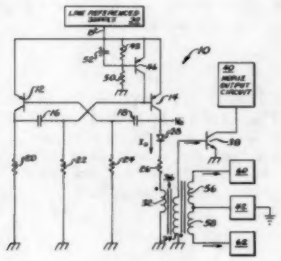
means responsive to said regulated alternating polarity output voltage for developing an ultor voltage at said ultor terminal.

4,415,842

TELEVISION RECEIVER START-UP CIRCUIT

Raymond J. Kulka, Chicago, and William A. Trzyna, Elgin, both of Ill., assignors to Zenith Radio Corporation, Gleview, Ill.

Filed Aug. 12, 1982, Ser. No. 407,418
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—411 **8 Claims**



1. In an isolated, switched mode power supply for driving a DC load, said power supply including a line referenced voltage source and a line isolated voltage source, a transformer having first and second primary windings wherein said second primary winding is coupled to and energized by said line isolated voltage source, a start-up circuit comprising:

oscillating means coupled to and energized by said line referenced voltage source for providing a pulsed output current in response thereto said first primary winding;

a secondary winding of said transformer inductively coupled to said first and second primary windings and responsive to pulsed signals therein for respectively generating a start-up signal and a drive signal in response thereto;

switch means coupled to said DC load and to said secondary winding and responsive to said start-up signal output therefrom for initially driving said DC load when said oscillating means is initially energized and subsequently responsive to said drive signal for continuing to drive said DC load; and

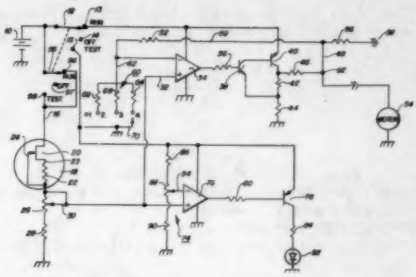
timing means coupled to said line referenced voltage source and said oscillating means for terminating the oscillation thereof after a predetermined time interval whereupon said start-up signal is no longer provided to said switch means with continued power supply operation sustained by said line isolated voltage source.

4,415,843

VOLTAGE REGULATOR

Gary Feldman, Wilmette, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 13, 1981, Ser. No. 243,539
Int. Cl.³ G08B *21/00;* **H02J** *7/00*
U.S. Cl. 318—139 **15 Claims**



1. A voltage regulator circuit which comprises:

a DC voltage input;

means coupled to said input for providing a voltage reference;

first amplifier means having a positive input, a negative input and an output, said first amplifier means having one of its inputs coupled to said voltage reference means;

ratio control means coupled to the other input of said amplifier means for setting the gain of said first amplifier means;

feedback means coupled from an output of said first amplifier means to said other input of said first amplifier means;

a second amplifier means having a positive input, a negative input and an output;

means coupling said voltage reference to one of the inputs of said second amplifier means;

a voltage divider coupled to the other input of said second amplifier means for simulating the load at the output of said first amplifier means; and

indicating means coupled to the output of said second amplifier means;

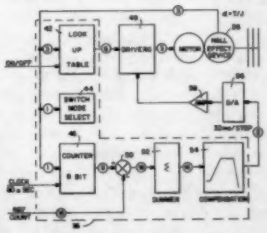
said first amplifying means including a pair of transistors connected to provide a double inversion.

4,415,844

DIGITAL MOTOR SPEED CONTROLLER

Charles E. Mendenhall, Campbell, and Michael D. Buckert, Fremont, both of Calif., assignors to Priam, San Jose, Calif.

Filed Feb. 9, 1981, Ser. No. 230,448
Int. Cl.³ H02P *5/06*
U.S. Cl. 318—254 **10 Claims**



1. Control apparatus for a polyphase brushless DC motor comprising switch means for selectively applying a current through each winding of said motor, position means for detecting angular position of the rotor of said motor with respect to

the stator of said motor, speed detection means for determining rotational speed of said rotor, computation means, means for applying a reference speed signal to said computation means, means interconnecting said position means to said computation means, means connecting said speed detection means to said computation means, means responsive to said computation means for controlling said switch means in response to angular position of said rotor, and means responsive to rotational speed of said rotor for linearly controlling magnitude of current applied through each phase of said motor.

4,415,845

ELECTRIC MOTOR CONTROL DEVICE

Claude Oudet, Besancon, France, assignor to Portescap, La-Chaux de-Fonds, Switzerland

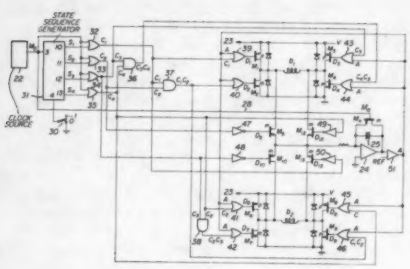
PCT No. PCT/CH81/00011, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/02207, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 30, 1981, Ser. No. 305,626

Claims priority, application Switzerland, Jan. 30, 1980, 732/80

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **2 Claims**



1. A control device for a two-phase stepper motor of the type comprising a permanent magnet rotor and at least two separate magnetic stator circuits each coupled with at least one electric coil, this control device comprising an electric power source, a source of clock signals, a logic control circuit including a state-sequence generator, a level comparator and logic circuitry, the control device further comprising a resettable integrator circuit and a controllable switching circuit, said switching circuit being adapted to connect said electric coil or coils associated with either one of the motor phases to the electric power source or to the input of said integrator circuit, in accordance with control signals delivered to the switching circuit by said logic control circuit, said integrator circuit having its output connected to one input of said level comparator the other input of which is connected to a predetermined position reference voltage, said state sequence generator being connected by its input to said source of clock signals and said logic circuitry being connected to combine outputs of said state sequence generator, of said clock-signal source and of said level comparator and to provide said control signals for the switching circuit to the effect that for rotation of the motor in a given direction driving pulses are alternatively delivered to the coils associated with either phase of the motor, that at least one of the coils associated with the phase not supplied by a driving pulse is temporarily connected to the integrator circuit and that each driving pulse is cut-off when the rotor reaches a predetermined position between two consecutive stable equilibrium positions.

4,415,846

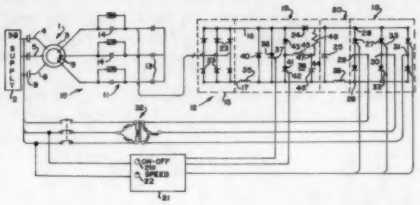
WOUND ROTOR MOTOR APPARATUS

Shashi B. Dewan, Toronto, Canada, assignor to Marathon Electric, Wausau, Wis.

Filed Mar. 9, 1981, Ser. No. 241,756

Int. Cl.³ A02P *5/40*

U.S. Cl. 318—732 **15 Claims**



1. A wound rotor motor control apparatus for a wound rotor motor having a stator adapted to be connected to an alternating current supply means and a rotor, comprising a rectifying means adapted to be connected to the rotor to establish a direct current output, a phase controlled inverter means connected to said rectifying means and having output means adapted to be connected to said alternating current supply means to return the power to the supply means, and voltage control means including a voltage chopping circuit means connected to the rectifying means and said inverter means to establish a predetermined essentially constant voltage to said inverter means for all motor speeds and to return power to said supply means at essentially unity power factor.

4,415,847

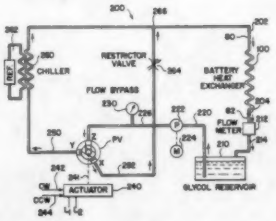
METHOD AND APPARATUS FOR SUPPLYING COOLING LIQUID TO A STORAGE BATTERY

James H. Galloway, New Baltimore, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Aug. 7, 1981, Ser. No. 291,029

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—2 **39 Claims**



1. A method of charging an electric storage battery by an actuatable, electrical supply located in or near a charging unit, said battery having a heat responsive characteristic to be controlled in accordance with a time-based temperature relationship at a given area of said battery by circulating a liquid through said battery and at said area and controlling the temperature of said liquid in accordance with said time-based relationship, said battery being mounted on an electric powered motor vehicle for driving said vehicle and having charging terminals, said method comprising the steps of:

(a) connecting said power supply across said charging terminals of said battery;

(b) providing a battery heat exchanger in said battery at said given area, said heat exchanger having an inlet portion for receiving a liquid, an outlet portion for discharging said

liquid and an intermediate heat exchanger element for cooling said given area of said battery;
(c) connecting said inlet and outlet portions into a fluid circuit in said charging unit;
(d) pumping liquid through said battery heat exchanger at a known flow rate whereby said discharged liquid is at a temperature higher than the temperature of said liquid flowing into said battery heat exchanger;
(e) dividing said discharged liquid into a first and second portion;
(f) cooling said first portion in said charging unit;
(g) combining said cooled first portion and second portion into said liquid flowing into said battery heat exchanger; and,
(h) adjusting the ratio of the combining flow rates of said first and second portions in accordance with said time-based relationship.

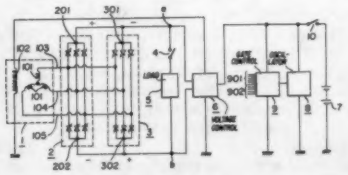
27. An apparatus for charging an electric storage battery by an actuatable, electrical power supply located in or near a charging unit, said battery having a heat responsive characteristic to be controlled in accordance with a time-based temperature relationship at a give area of said battery by circulating a liquid through said battery and at said area and controlling the temperature of said liquid in accordance with said time-based relationship, said battery being mounted on an electric powered motor vehicle for driving said vehicle and having charging terminals, said apparatus comprising the following:
(a) means for connecting said power supply across said charging terminals of said battery;
(b) means for providing a battery heat exchanger in said battery at said given area, said heat exchanger having an inlet portion for receiving a liquid, an outlet portion for discharging said liquid and an intermediate heat exchanging element for cooling said given area of said battery; (c) means for connecting said inlet and outlet portions into a fluid circuit in said charging unit;
(d) means for pumping liquid through said battery heat exchanger at a known flow rate whereby said discharged liquid from said heat exchanger is at a temperature higher than the temperature of said liquid flowing into said battery heat exchanger;
(e) means for dividing said discharged liquid into a first and second portion;
(f) means for cooling said first portion in said charging unit;
(g) means for combining said cooled first portion and second portion into said liquid flowing into said battery heat exchanger; and,
(h) means for adjusting the ratio of the combining flow rates of said first and second portions in accordance with said time-based relationship.

4,415,848

ALTERNATING CURRENT POWER SOURCE APPARATUS FOR CAR

Mitsuharu Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 73,132, Sep. 6, 1979, abandoned. This application Oct. 2, 1981, Ser. No. 308,237
Claims priority, application Japan, Sep. 15, 1978, 53-127508
Int. Cl.[3] H02J *7/14;* **H02P** *9/14, 9/42*
U.S. Cl. 322—32 **3 Claims**



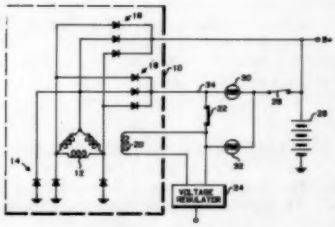
1. An alternating current power source apparatus which comprises an AC generator outputting a three-phase signal having a field coil which is driven by an engine;
a battery for supplying a field current to the field coil of said AC generator;
a first rectifier having three gated thyristors, each one of which is associated with one of said three phases of said generator output, which rectify the AC output of said AC generator;
a second rectifier having three gated thyristors, each one of which is associated with one of said phases of said generator output, which is connected in parallel to said first rectifier and said AC output of said generator and is connected to give an output having a polarity reverse to the polarity of the output of said first rectifier;
a load driven by single phase AC power connected to said first and second rectifier;
a voltage control device responsive to said outputs of said first and second rectifiers for controlling the output voltage of said generator to a predetermined value by controlling a field current passing from said battery through said field coil;
an oscillator for oscillating at a desired frequency; and
a gate signal generating circuit which is controlled by said oscillator so as to feed a turn-on signal alternately to the gate of the thyristors of said first rectifier and the gate of the thyristors of said second rectifier.

4,415,849

ALTERNATOR PROTECTION SYSTEM

Kirk A. Sievers, Roselle, and Dean C. Santis, Winfield, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1982, Ser. No. 361,715
Int. Cl.[3] H02J *7/14;* **H02H** *7/06;* **H02K** *11/00*
U.S. Cl. 322—99 **6 Claims**

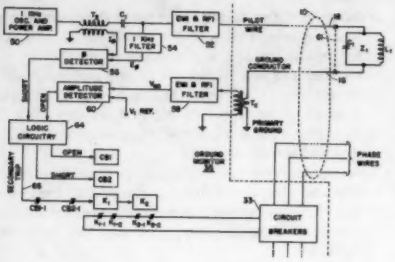


1. An alternator protection system comprising:
first terminal means for supplying to a load a first rectified alternator output current at a predetermined voltage;
second terminal means for supplying to a load a second rectified alternator output current at the predetermined voltage;
first indicator means coupled to the second terminal means;
thermal switching means coupled to the second terminal means;
field coil means coupled to the thermal switching means;
regulator means coupled to the thermal switching means and the field coil means for regulating the voltage in the field coil means;
second switching means coupled between the first indicator means and the first terminal means; and
second indicator means coupled across the series combination of the first indicator means and the thermal switching means.

4,415,850
GROUND CONDUCTOR MONITORING SYSTEM

John R. Sherwood, Arlington, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 12, 1981, Ser. No. 233,819
Int. Cl.³ G01R 31/02
U.S. Cl. 324—51 6 Claims



1. The method of monitoring the condition of the ground conductor of an electrical power cable that also includes a plurality of power or phase wires and at least one other wire, all of which extend from one end to the opposite end of the cable, said method comprising the steps

earth grounding said ground conductor only at said one end,

coupling an a.c. test signal between said one end of the ground conductor and the corresponding end of said other wire,

terminating the ground conductor and the other wire at said opposite end of the cable in an impedance that presents at least a predetermined capacitive reactance at the test signal frequency when monitored at said one end of the cable,

monitoring the reactance of said terminating impedance and

producing a fault signal when the reactance of the cable as monitored at said one end changes from said predetermined capacitive reactance,

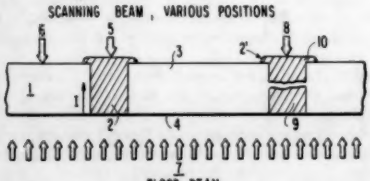
sampling the test signal current flowing in said ground conductor at said one end of the cable, and

producing a fault signal when the sampled test signal current is below a predetermined magnitude.

4,415,851
SYSTEM FOR CONTACTLESS TESTING OF MULTI-LAYER CERAMICS

Guenther O. Langner, Hopewell Junction, N.Y., and Hans C. Pfeiffer, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1981, Ser. No. 267,118
Int. Cl.³ G01R 31/02
U.S. Cl. 324—51 17 Claims



1. A method of testing electrical connections disposed through an insulating material without physical contact comprising the steps of:

irradiating one side of said insulating material with a first electron beam to charge said material and said electrical connections to a given potential;

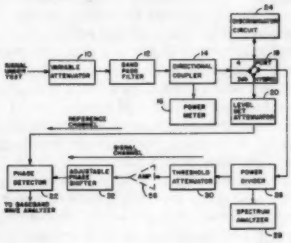
generating a second electron beam on an opposite side of said material to cause secondary electron emission from connections which are at said given potential; and

detecting the presence of connections not at a given potential.

4,415,852
SINGLE HYBRID JUNCTION FREQUENCY DISCRIMINATOR

James R. Ashley, Tampa, Fla.; Thomas A. Barley, and Gustaf J. Rast, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 26, 1981, Ser. No. 315,328
Int. Cl.³ G01R 27/04; H01P 7/04
U.S. Cl. 324—57 N 8 Claims



1. A discriminator for measuring input frequency modulation noise signals comprising:

a bandpass filter having an input and an output, said input being adapted to receive input signals;

signal routing means having a plurality of input-output ports, a first port of said ports being coupled to the output of said bandpass filter for receiving noise signals therefrom;

a discriminator circuit means having an input-output port coupled to a second port of said signal routing means ports for receiving signals from said second port and directing signals back thereto;

a first signal channel having an input and an output, said input being coupled to a third port of said signal routing means for receiving said signals from said discriminator circuit means coupled to said signal routing means second port;

quadrature detection means having first and second inputs and an output, said first input being coupled to the output of said first channel, and the output being adapted for coupling output measurement signals therefrom; and

a second signal channel having an input and an output, said input being coupled to a fourth port of said signal routing means, and said output being coupled to said second input of said quadrature detection means for providing a reference channel input, to said quadrature detection means.

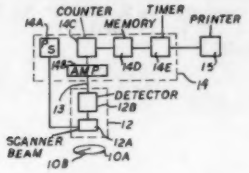
4,415,853
MONITORING DEVICE AND METHOD FOR ACCURATELY DETERMINING AND RECORDING PRESENT DEMAND OF ELECTRICAL ENERGY

Berish M. Fisher, 629 Ave. M, Brooklyn, N.Y. 11210

Continuation-in-part of Ser. No. 940,458, Sep. 8, 1978, abandoned. This application Oct. 21, 1980, Ser. No. 199,386
Int. Cl.³ G01R 35/04, 11/64
U.S. Cl. 324—74 12 Claims

1. A device for monitoring peak demand electric usage from an electric usage meter having a rotating disc and a peak demand meter integrated therewith, said peak demand meter being mechanically activated and designed to be reset if said

peak demand electric usage is not maintained for a predetermined continuous time interval, said device comprising means for sensing rotation of said disc, timing means, and a printing calculator containing counting, memory and printing means, said counting means being adapted to receive signals from said sensor and to count rotations of said disc, and said memory means retaining a cumulated total of said counted rotations and wherein said printing means is adapted to print said cumulated



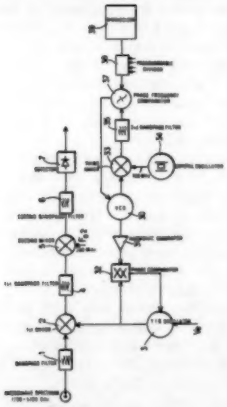
total of rotations after a period of time no longer than said predetermined continuous time interval of said peak demand meter, whereby the number of rotations during said period of time can be ascertained; and said printing means being adapted to be activated by said timing means to print out the time together with said cumulated total of rotations whereby electric usage for said time period can be ascertained and wherein determination of electric usage during said period of time by said device determines the accuracy of the peak demand meter.

4,415,854

MICROWAVE SPECTRUM ANALYZER WITH A SYNTHESIZED LOCAL OSCILLATOR

Joël Remy, Paris, France, assignor to Adret Electronique, France

Filed May 18, 1981, Ser. No. 264,372
Claims priority, application France, May 23, 1980, 80 11564
Int. Cl.³ G01R *23/14*
U.S. Cl. 324—79 R **1 Claim**



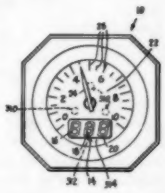
1. A microwave spectrum analyzer comprising: a first mixer having a first input to which is applied the spectrum to be analyzed, a second input and an output; a YIG oscillator having an output connected to the second input of the first mixer, said YIG oscillator further having a frequency control input; a first band-pass filter keyed to a fixed frequency which is outside the frequency range of the spectrum to be analyzed, said first filter having an input connected to the output of the first mixer and an output; a second mixer having an output, a first input connected to the output of the said filter, a second input receiving a fixed transposition frequency; a second band-pass filter having an input connected to the output of the second mixer and an output; a detector connected to the output of the second filter; a crystal oscillator of relatively low frequency; a harmonic generator having an input and an output; a voltage-controlled oscillator having a frequency control input and first and second outputs, the second output being connected to the input of the said harmonic generator; a third mixer having an output, a first input connected to the first output of the voltage-controlled oscillator and a second input connected to the crystal oscillator; a synthesizer, the frequency of which varies by increments substantially lower than the frequency of said crystal oscillator; a programmable divider having an input connected to said synthesizer and an output; phase-frequency comparator means having an output connected to the frequency control input of the voltage-controlled oscillator, a first input connected to a third band-pass filter having an input connected to the output of the third mixer and an output connected to the second input of the phase-frequency comparator, and a phase comparator having a first input connected to the output of the YIG oscillator, a second input connected to the output of the harmonic generator and an output connected to the frequency control input of the YIG generator.

4,415,855

COMBINATION ANALOG-DIGITAL INDICATOR

Thomas A. Dubauskas, Waterbury, Conn., assignor to The Lewis Engineering Company, Naugatuck, Conn.

Continuation-in-part of Ser. No. 29,569, Apr. 12, 1979, Pat. No. 4,258,317. This application Feb. 2, 1981, Ser. No. 230,557
The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.
Int. Cl.³ G01R *1/00, 1/08*
U.S. Cl. 324—114 **15 Claims**



1. An electrical indicator device for providing continuous and simultaneous analog and digital readings of a particular single electrical parameter which is to be continuously monitored, comprising in combination:

(a) an electro-responsive device,

(b) a meter scale plate having a useful indicating area provided with calibrating indicia,

(c) a pointer connected to said electro-responsive device and movable over said useful indicating area,

(d) said indicator device having an input circuit adapted to be connected to the source of the parameter being monitored,

(e) a liquid crystal digital display, and

(f) a digital voltmeter having its input connected to the input circuit of the device, and having an output connected to drive the liquid crystal display,

(g) said display comprising multiple digits, each digit having a backplane and multiple segments which are selectively energized to produce numerical designations,

(h) said segments being disposed closely adjacent said useful indicating area but lying completely outside of the same, and being disposed outside of the useful range of movement of the pointer so as to be not interfered with by the latter whereby all of said segments are always completely visible in a single glance from the front of the indicator device simultaneously with the viewing of said useful indicating area and regardless of the position of the pointer on said area,

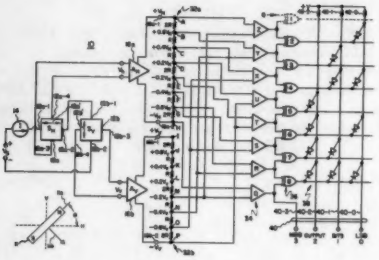
(i) said meter scale plate being substantially circular and having a central opening providing clearance for the pointer support,
(j) said multiple segments of the digital voltmeter being located below the central opening of the scale plate,
(k) said electro-responsive device and liquid crystal display being connected to continuously respond to the single, same electrical parameter being monitored,
(l) means for electrically illuminating the pointer along its length, and
(m) a light mask for shielding light from said pointer-illuminating means, forwardly of the pointer.

4,415,856

ROTATABLE MAGNETIC FIELD-SENSING SOLID-STATE SWITCH APPARATUS

Kenneth B. Welles, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 19, 1981, Ser. No. 225,885
Int. Cl.³ G01B 7/14; H01L 43/08
U.S. Cl. 324—208 **9 Claims**



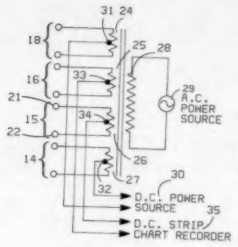
1. A solid-state rotary switch apparatus, comprising:
a magnetic member rotatable in a plane;
first and second magnetic field sensors each having a sensor axis disposed substantially perpendicular to one another and in another plane adjacent to the plane of magnetic member rotation; each sensor providing an output signal of magnitude proportional to the angle of said magnetic member with respect to the sensor axis thereof; and
means responsive to the outputs of said sensors for providing digital data indicating that one of a preselected plurality P of angular rotational positions of said magnetic member, with respect to a rotational reference, to which a selected pole of said member is presently rotated, said digital data providing means including: first and second differential-input, differential-output amplifiers each receiving the output signal of one of said sensors; a resistance element chain connected between the differential outputs of each of said amplifiers; a plurality of two-input comparators, the inputs of each comparator being connected to terminals of said resistance chain in preselected manner to cause each comparator output to be enabled when said selected pole of said magnetic member is at different ones of π radians of rotation from said reference line; a plurality of two-input exclusive-OR-gates, each gate having each input thereof connected to a different one of two adjacent ones of said comparators for enabling a gate output only when said magnetic member is positioned at diametrically-opposed different ones of the plurality of possible rotational positions of said magnetic member; a plurality N of data output lines, where the number P of possible rotational positions of said member, and therefore of said switch apparatus, is given by $P=2^N$; and a diode array for connecting the outputs of said gates to the $(N-1)$ least significant output lines, with the output of a selected one of said comparators being connected directly to the most significant bit data output line, to provide an N-bit digitally-coded output of that one of 2^N positions of said magnetic member with respect to said reference line.

4,415,857

NON-POLARIZING ELECTRODE SYSTEM FOR GEOPHYSICAL PROSPECTING AND THE LIKE

Ralph L. Cordell, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 933,005, Aug. 11, 1978, abandoned.
This application Sep. 2, 1980, Ser. No. 183,477
Int. Cl.³ G01V 3/20
U.S. Cl. 324—357 **14 Claims**



1. A combined non-polarizing electrode system for geophysical prospecting, well logging, and the like, comprising:
a first adjacent pair of electrodes connected to opposite ends of a first secondary winding of an alternating current transformer;
second, third, and fourth adjacent pairs of electrodes connected, in a manner similar to the connection of said first pair of electrodes, to second, third, and fourth secondary windings, respectively, of said alternating current transformer;
a depolarizing alternating current source connected to the primary winding of said alternating current transformer;
a direct current power source connected between said first and fourth secondary windings for generating a measuring current in the earth between said first pair of electrodes and said fourth pair of electrodes, said first and fourth pair of electrodes being spaced a distance L apart;
a direct current measuring device connected in series with said direct current power source for measuring said measuring current; and
a direct voltage measuring device connected between said second and third secondary windings for measuring a potential difference in the earth caused by the flow of said measuring current between said second pair of electrodes and said third pair of electrodes, said second and third pairs of electrodes being spaced intermediate said first and fourth pairs of electrodes, whereby said direct voltage measurement in combination with said direct current measurement provides an indication of the resistivity of the earth between said second and said third electrode pairs, and said depolarizing alternating current source causes a depolarizing alternating current to flow between said adjacent pairs of electrodes.

4,415,858

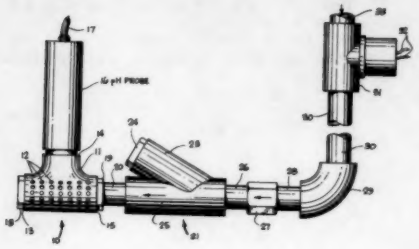
PH METER PROBE ASSEMBLY

Charles J. Hale, San Jose, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 12, 1981, Ser. No. 273,154
Int. Cl.³ G01N 27/56
U.S. Cl. 324—438 **13 Claims**

1. A pH probe assembly for measuring the pH in effluents, such as in sanitary and storm sewers, said assembly comprising a perforated housing having a pH probe mounted therein and containing a filter media which surrounds at least a portion of

said pH probe for preventing contamination of said pH probe, and means connected to said perforated housing for periodically flushing said filter media for removing contaminants therefrom.



4,415,859

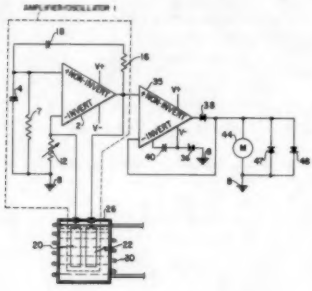
PARAFFIN MONITOR

Carlton M. Slough, Spring, and Edwin L. Colling, Jr., Sugarland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 194,697, Oct. 6, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,358

Int. Cl.³ G01N *27/00, 33/28*

U.S. Cl. 324—442 **8 Claims**



1. A paraffin monitor which comprises:

amplifier/oscillator means connected to ground, including a pair of probes immersed in a medium containing paraffin, the amplifier/oscillator means being means for providing an output signal corresponding to the quantity of paraffin on the probes while introducing a small anti-polarizing current in the medium between the probes; and

indicating means connected to ground and to the amplifier-/oscillator means, the indicating means being means for providing an indication of the change in the amount of paraffin on the probes in accordance with the output signal from the amplifier/oscillator means.

4,415,860

SINE WAVE TO TRIANGLE WAVE CONVERTOR

Kwok S. Lo, San Diego, Calif., assignor to Wavetek, San Diego, Calif.

Filed Mar. 20, 1981, Ser. No. 245,995

Int. Cl.³ H03K *5/00, 4/10*

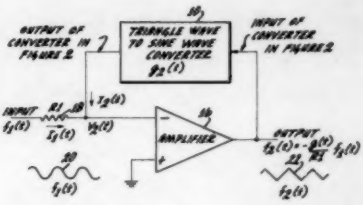
U.S. Cl. 328—22 **10 Claims**

1. A sine wave to triangle wave converter including

an amplifier having and input terminal and an output terminal,

a sine convertor having an input terminal and an output terminal and for producing a sine wave at the output terminal in accordance with the application of a triangle wave at the input terminal and with each cycle of the triangle wave producing a corresponding cycle of the sine wave and with each sloping portion of each cycle of the triangle wave producing a corresponding sine wave portion of the sine wave,

the output terminal of the amplifier coupled to the input terminal of the sine convertor and the output terminal of the sine convertor coupled to the input terminal of the amplifier, and



means coupled to the input terminal of the amplifier for coupling an input sine wave to the amplifier to produce an output triangle wave at the output terminal of the amplifier and with each cycle of the sine wave producing a corresponding cycle of the triangle wave and with each sine wave portion of the sine wave producing a corresponding sloping portion of the triangle wave.

4,415,861

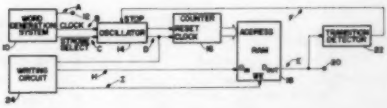
PROGRAMMABLE PULSE GENERATOR

Steven R. Palmquist, Beaverton, and Ronald D. Gaiser, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 8, 1981, Ser. No. 271,729

Int. Cl.³ H03K *5/26, 3/017*

U.S. Cl. 328—58 **6 Claims**



1. A programmable pulse generator, comprising:

an oscillator for generating a pulse in response to a trigger signal;

a counter for counting the pulse from said oscillator to generate an address signal;

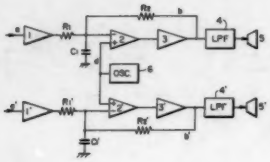
a memory circuit for generating a pulse having predetermined leading and trailing edges in accordance with the address signal from said counter; and

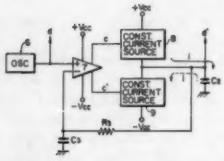
a transition detector for detecting the trailing edge of the pulse from said memory circuit to stop the oscillation of said oscillator, said transition detector comprising a first D-type flip-flop to receive the output from said memory circuit at a D input terminal thereof and the pulse from said oscillator at a clock terminal thereof, a second D-type flip-flop to receive the Q output from said first D-type flip-flop at a D input terminal thereof and the pulse from said oscillator at a clock terminal thereof, and an AND gate to receive the $\overline{Q}$ output from said first D-type flip-flop and the Q output from said second D-type flip-flop, the output from said AND gate stopping the oscillation of said oscillator.

4,415,862
PULSE WIDTH MODULATION AMPLIFIER

Yoshiro Kunugi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,036
Claims priority, application Japan, Mar. 28, 1980, 55-39023
Int. Cl.³ H03F 3/38
U.S. Cl. 330—10 3 Claims



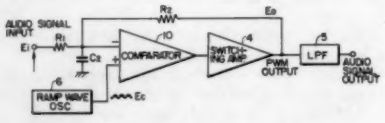


1. A pulse width modulation amplifier for a plurality of channels comprising: first and second channel amplifiers each comprising a pulse width modulation comparator, said first and second channel amplifiers providing separate uncombined output representing different input signals; and means for applying ramp carrier signals having a phase difference therebetween of substantially 90° to respective ones of said pulse width modulation comparators wherein rise and fall times of output rectangular pulses of said comparators occur at different times between said first and second channel amplifiers.

4,415,863
PULSE WIDTH MODULATION AMPLIFIER

Akio Tokumo, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,033
Int. Cl.³ H03F 3/38
U.S. Cl. 330—10 7 Claims

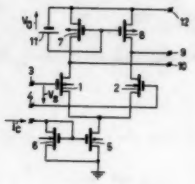


1. A pulse width modulation amplifier comprising: a comparator, an inverting input terminal of said comparator being coupled to an input signal source through a first resistor; a ramp wave oscillator having an output coupled to a noninverting input of said comparator; a switching amplifier having an input coupled to an output of said comparator; a low-pass filter having an input coupled to an output of said switching amplifier; a second resistor coupled between said output of said switching amplifier and said inverting input terminal of said comparator; and a capacitor coupled between said inverting input terminal of said comparator and ground.

4,415,864
VARIABLE-GAIN AMPLIFIER STAGE EQUIPPED WITH FIELD-EFFECT TRANSISTORS

Wouter M. Boeke, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,528
Claims priority, application Netherlands, Feb. 25, 1980, 8001117
Int. Cl.³ H03F 3/45
U.S. Cl. 330—253 8 Claims

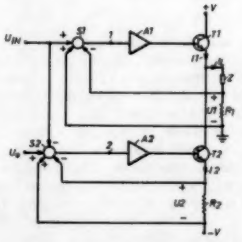


1. A variable gain amplifier stage comprising first and second field-effect transistors of a first conductivity type whose gate electrodes constitute the input of the amplifier stage and whose source electrodes are jointly connected to a controllable current source for controlling the slope of the first and the second field-effect transistors, third and fourth field-effect transistors, means connecting said third and fourth transistors as loads in the drain circuits of the first and second transistors, an output signal being available between the drain electrodes of the first and second field effect transistors, and means for operating the third and fourth transistors in the triode region.

4,415,865
CIRCUIT ARRANGEMENT FOR CONTROLLING THE QUIESCENT CURRENT IN A CLASS AB AMPLIFIER STAGE

Rolf E. O. Gustafsson, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 23, 1981, Ser. No. 246,910
Claims priority, application Sweden, Apr. 1, 1980, 8002484
Int. Cl.³ H03F 1/34, 3/26
U.S. Cl. 330—271 5 Claims



1. A quiescent controlled class AB amplifier comprising a supply voltage source having first and second terminals, first and second amplifiers each having input, output and common terminals, means for connecting the common terminal of said first amplifier to the first terminal of said supply voltage source, first impedance means for connecting the output terminal of said second amplifier to the second terminal of said supply voltage source, means for connecting the output terminal of said first amplifier to the common terminal of said second amplifier, a reference potential source, a load having one terminal connected to the output terminal of said first amplifier and another terminal, second impedance means connecting the

other terminal of said load to said reference voltage source, a source of an input signal to be amplified, first signal processing means for subtracting a voltage developed across said first impedance means from the input signal to provide a difference signal, first connecting means for connecting the output of said first signal processing means to the input terminal of said first amplifier, a source of constant quiescent voltage, a second signal processing means for adding to the inverse of said input signal to the constant quiescent voltage and subtracting therefrom a voltage developed across said second impedance means, and second connecting means for connecting the output of said second signal processing means to the input terminal of said second amplifier.

4,415,866

CIRCUIT FOR DYNAMIC COMPRESSION AND/OR EXPANSION

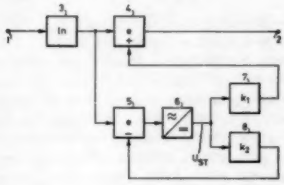
Jürgen Wermuth, Peine-Stederdorf, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,661

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044661

Int. Cl.³ H03G *3/30*; G06G *7/24*

U.S. Cl. 330—278 **10 Claims**



1. In a circuit for the automatic dynamic compression or expansion of a signal between the input and output of the circuit, the circuit presenting a useful signal path connected between its input and output and containing a first variable gain member which has a control input and which is electronically controllable in response to a first control signal at its control input for varying the transmission factor between the circuit input and output, the circuit also presenting a branch path having an input point connected to the useful signal path and containing a control voltage generator for generating a control voltage from the signal at such point in the useful signal path, a second variable gain member which is connected in the branch path and which has a control input and which is electronically controllable in response to a second control signal at its control input for varying the transmission factor exhibited by the branch path, and means connecting the output of the control voltage generator to the variable gain members supplying respective first and second control signals thereto for causing the transmission factor of the useful signal path to have a value dependent on the value of the control voltage and for effecting a counterregulation of the transmission factor of the branch path relative to the transmission factor variation imparted to the useful signal path, the improvement wherein:

said useful signal path includes means causing the signal at one point along said path to have a value proportional to the logarithm of the signal at said circuit input;

said branch path has its input point connected to said one point of said useful signal path;

each of said variable gain members constitutes means having a transmission factor which is antilogarithmic and which varies as an exponential function of the control voltage; and

said means connecting the output of the control voltage generator serve to cause the first and second control signals to have respectively different values.

4,415,867

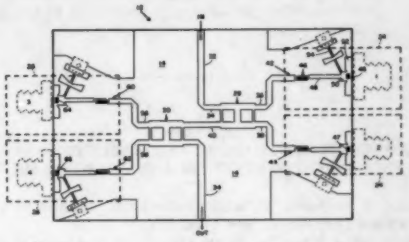
HYBRID COUPLED MICROSTRIP AMPLIFIER

David Rubin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1981, Ser. No. 266,229

Int. Cl.³ H03F *3/60*

U.S. Cl. 330—287 **10 Claims**



1. A microstrip amplifier comprising:

a dielectric substrate having a top surface and a bottom surface;

a 3 db microstrip quadrature coupler disposed on said dielectric substrate top surface, said 3 db quadrature coupler having first, second, third and fourth ports, said first port comprising an input port and said second port comprising an output port;

a first reflection amplifier connected to said third port;

a second reflection amplifier connected to said fourth port, said second reflection amplifier being substantially identical to said first reflection amplifier;

said first reflection amplifier being connected to said third port by a first microstrip DC filter;

said second reflection amplifier being connected to said fourth port by a second microstrip DC filter;

first and second microstrip transformer sections each connecting one of said first and second microstrip DC filters to its respective reflection amplifier; and

first and second microstrip stub sections, each being connected to one of said first and second microstrip transformer sections.

4,415,868

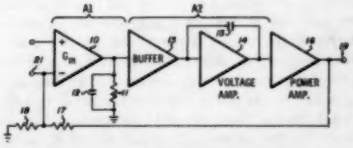
ONE AND ONE HALF POLE AUDIO POWER AMPLIFIER FREQUENCY COMPENSATION

William H. Gross, Tokyo, Japan, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 27, 1981, Ser. No. 287,386

Int. Cl.³ H03F *1/34, 3/183*

U.S. Cl. 330—294 **5 Claims**



1. An operational amplifier for providing substantial gain of audio frequencies and having very low response at frequencies within the AM standard radio broadcast band, said amplifier comprising:

first amplifying means having a gain characteristic in which the response is flat at low frequencies and rolls off at a 6 db per octave to a unity gain value at a frequency in the vicinity of the low end of said AM standard radio broadcast band;

second amplifying means having a gain characteristic higher than that of said first amplifying means and a gain characteristic in which the response falls off at a 6 db per octave rate within said audio frequencies to a unity gain value near the same frequency as said first amplifying means;

means for coupling said first and said second amplifying means in a cascaded configuration; and

gain controlling negative feedback means around both said first and said second amplifying means for determining the overall amplifier gain at a level above that of said first amplifying means.

4,415,869

SAWTOOTH GENERATOR SWITCHABLE BETWEEN A FREE-RUNNING STATE OR A SYNCHRONIZABLE STATE

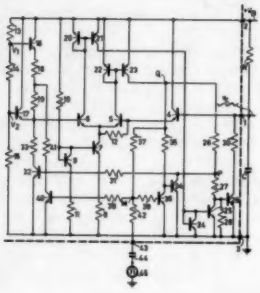
Peter A. Duijkers, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 89,006, Oct. 29, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,355

Claims priority, application Netherlands, Nov. 27, 1978, 7811597

Int. Cl.³ H03K *3/26*

U.S. Cl. 331—111 **16 Claims**



1. A circuit arrangement for generating a sawtooth shaped voltage across a capacitor, comprising charging current means for charging said capacitor until a first threshold voltage is reached and discharging current means for subsequently discharging said capacitor until a second threshold voltage is reached, means for measuring and controlling the capacitor voltage, and means for switching said charging and discharging current means respectively, the free-running frequency of the sawtooth voltage thus generated being determined by the difference between said first and second threshold voltages and by the intensity of said charging and discharging currents respectively, the circuit arrangement further comprising a synchronizing signal detector connected to said circuit arrangement for establishing the presence of a source of synchronizing pulses connected to said synchronizing signal detector, said synchronizing pulses having a substantially constant nominal repetition frequency, said signal detector switching the circuit arrangement between a first state in the absence of said synchronizing pulses wherein the free-running frequency of the sawtooth voltage is substantially equal to the nominal repetition frequency of said synchronizing pulses and a second state in the presence of said synchronizing pulses wherein the free-running frequency of said sawtooth voltage is lower than said nominal repetition frequency, the circuit arrangement being thus in its second state synchronizable by said synchronizing pulses.

4,415,870

OSCILLATOR CIRCUIT WITH DIGITAL TEMPERATURE COMPENSATION

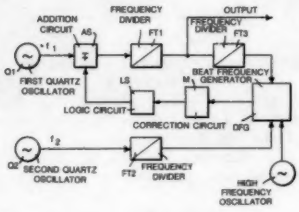
Alphonse Zumsteg, Solothurn, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services SA, Bienne, Switzerland

Filed Dec. 19, 1980, Ser. No. 218,405

Claims priority, application Switzerland, Jan. 10, 1980, 157/80

Int. Cl.³ H03B *5/04, 5/32;* H03L *1/02*

U.S. Cl. 331—176 **5 Claims**



1. An oscillator circuit with digital temperature compensation comprising:

(a) a first low-frequency oscillator;

(b) a second low-frequency oscillator; and

(c) a temperature compensation circuit cooperating with the first and second low-frequency oscillators and having:

(i) a beat frequency generator controlled by an independent high-frequency oscillator connected thereto, for receiving frequency signals generated by said low frequency oscillators, and for generating a difference frequency representing the difference between the frequencies generated by said low frequency oscillators;

(ii) a correction circuit connected to the beat frequency generator for receiving the difference frequency and generating a correction signal, said correction circuit having a PROM for storing correction functions, and

(iii) means for varying the frequency signals of the first low-frequency oscillator, said means connected to the correction circuit and varying the first low-frequency oscillator signal in response to the signal generated by the correction circuit.

4,415,871

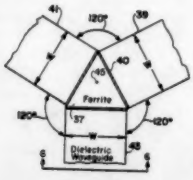
DIELECTRIC WAVEGUIDE CIRCULATOR

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 13, 1981, Ser. No. 310,542

Int. Cl.³ H01P *1/383*

U.S. Cl. 333—1.1 **13 Claims**



8. A Y-junction circulator comprising a dc magnetized triangular right prism having non-reciprocal properties and rectangular lateral faces, three millimeter wavelength dielectric waveguides having rectangular ends bonded to the respective

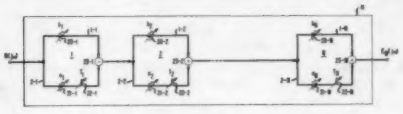
lateral faces of said prism, the waveguide ends being congruent with the lateral faces of said prism.

4,415,872

ADAPTIVE EQUALIZER

Peter D. Karabinis, Atkinson, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 17, 1981, Ser. No. 293,463
Int. Cl.³ H04B *3/14*; H03H *7/03*
U.S. Cl. 333—18 **6 Claims**



1. An equalizer (**11**) comprising a plurality of feed-forward stages (**1**, **2**, . . . N) connected in cascade:

each stage comprising:

a first parallel wavepath (**1-1**, **1-2**, . . . **1-N**) including a first variable attenuator (**20-1**, **20-2**, . . . **20-N**);

a second parallel wavepath (**2-1**, **2-2**, . . . **2-N**) including a second variable attenuator (**21-1**, **21-2**, . . . **21-N**), and delay means (**22-1**, **22-2**, . . . **22-N**);

means (**23-1**, **23-2**, . . . **23-(N-1)**) for combining the signals in the parallel wavepaths of each of the first (**N-1**) stages and for coupling the combined signals to the next stage of said equalizer;

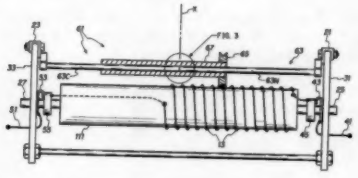
and means (**23-N**) for combining the signals in the parallel wavepaths of the N^{th} equalizer stage and for coupling the combined signals to the equalizer output terminal.

4,415,873

VARIABLE INDUCTOR HAVING REDUCED ARCING TENDENCY

Jack C. Thornton, Satellite Beach, Fla., and Randy G. Russell, Arlington Heights, Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1982, Ser. No. 364,292
Int. Cl.³ H01F *29/06*
U.S. Cl. 336—139 **5 Claims**



1. A variable inductor comprising:

a coil comprising multiple turns of electrical conductor wound to substantially follow a helical path, said coil being rotatable and having first and second ends;

a moveable, electrically conductive, contactor first means, located exteriorly of said coil, for continuously electrically contacting said coil one turn at a time and for traveling along a path substantially parallel to the side of the coil as the coil is rotated;

guide second means for guiding said first means along the first means path of travel, said second means being stationary, being elongated, and being oriented substantially parallel to the side of the coil, said second means having a first portion located in the vicinity of the first end, and having a second portion located in the vicinity of the second end, said second means also being at least partly non-conductive so that, when the first means is located in the vicinity of the second end, the second portion is electrically isolated from the first portion;

voltage access station third means, located further from the first end than the second end, for sharing any voltage potential present on said first means and for providing access to any voltage potential present on said first means, said third means being stationary, being electrically conductive, being suitable for being electrically connected to said first means, and being located and configured such that, when the first means is located in the vicinity of the second end, said third means is electrically isolated from the second means first portion;

moveable electrical connection fourth means for electrically interconnecting the moveable first means to the stationary third means, said forth means being mechanically coupled to said first means so as to move simultaneously therewith and so that as the first means travels away from the first end said fourth means also moves away from the first end,

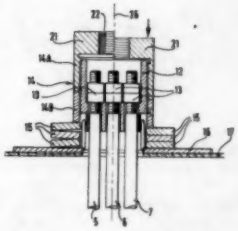
said first, second, third, and fourth means cooperating such that, when said first means has thereon a voltage potential V_1, the spatial location of V_1 moves away from said first end as said first means moves away from said first end.

4,415,874

ELECTRIC SHUNT INDUCTANCE WINDING FOR AN ELECTRICITY POWER TRANSPORT LINE

Gerard Messe, Maule, and Michel Faure, Houilles, both of France, assignors to Societe Anonyme dite: Alsthom-Atlantique, Paris, France

Filed Jul. 2, 1981, Ser. No. 279,648
Claims priority, application France, Jul. 4, 1980, 80 14918
Int. Cl.³ H01F *27/26*
U.S. Cl. 336—178 **4 Claims**

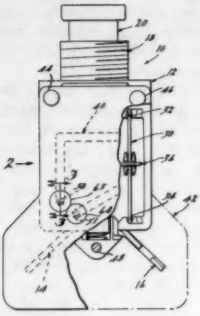


1. An electric shunt inductance winding for an electric power transport line, said inductance winding including a magnetic core, an electric winding surrounding said core, a magnetic barrel surrounding the electric winding to close the magnetic circuit, said magnetic barrel having two vertical legs, an upper cross bar and a lower cross bar connecting said legs together at opposite ends thereof, said magnetic core having a central hole and being constituted by a vertical stack of laminated iron core members separated from one another by spacers made of non-magnetic material, the improvement wherein the upper cross bar and the lower cross bar are clamped against the magnetic core and said vertical legs by means of a plurality of tie rods made of non-magnetic material passed through said central hole and through said cross-bars and spacing washers placed at regular intervals along the tie rods so as to prevent them from vibrating.

4,415,875
CIRCUIT BREAKER

Joseph F. Kirkup, Parma, and Randall A. Horning, Jackson, both of Mich., assignors to Mechanical Products, Inc., Jackson, Mich.

Filed May 18, 1982, Ser. No. 379,283
Int. Cl.³ H01H 71/16
U.S. Cl. 337—62 **3 Claims**



1. An electrical circuit breaker comprising:
a housing;
a pair of external terminals supported by said housing for connection to a source of electrical current;
an internal fixed contact supported by said housing connected to one of said terminals;
a contact carrier having a movable contact thereon which is movable with respect to said housing to a closed position wherein said movable contact is engaged with said internal contact;
current responsive means supported internally of said housing and electrically connected to said terminals when said movable contact is engaged with said fixed contact and responsive to current flow therethrough to effect separation of said contacts upon the occurrence of a predetermined electrical condition and,
a fusible element disposed externally of said housing and electrically connected in series with said contacts and operable to effect interruption of the electrical circuit through said circuit breaker upon failure of said current responsive means.

4,415,876
GAS SENSOR

Eturo Yasuda; Mitsuru Asano, and Minoru Ohta, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

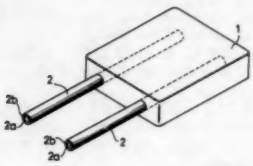
Filed Jan. 23, 1981, Ser. No. 227,780
Claims priority, application Japan, Jan. 25, 1980, 55-8200
Int. Cl.³ G01N 27/12; H01C 1/02
U.S. Cl. 338—34 **4 Claims**

1. A gas sensor comprising: a gas sensing element of which electrical resistance changes in accordance with gas components contained in sensing gas; a pair of lead members attached to said gas sensing element for reading an electrical resistance of said gas sensing element; a ceramic member in a tubular metallic body that is connected to ground, said gas sensing element being held at one end of said ceramic member which has a pair of throughholes for allowing said pair of lead members to pass therethrough; and a conductive member provided at said one end of said ceramic member and near said gas sensing element between the pair of said lead members, said conductive member being connected to ground, whereby when a deposit of conductive material builds up on said one end of said ceramic member and across said pair of lead members, the electrical resistance of said gas sensing element can be measured correctly.

4,415,877
GAS SENSING ELEMENT

Akio Takami; Tsutomu Saito; Toshifumi Sekiya, and Hideki Kudo, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Apr. 23, 1982, Ser. No. 371,343
Claims priority, application Japan, Apr. 25, 1981, 56/63175
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 **7 Claims**

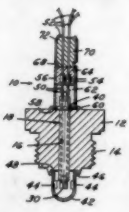


1. A gas sensing element, comprising:
a semiconductor formed of a sintered metal oxide and having an electrical resistance varying with a gas component to be sensed;
a pair of lead electrodes embedded in said semiconductor, each of said electrodes comprising a nickel wire core and a cover layer surrounding said core, said cover layer comprising an alloy essentially containing platinum metal and including at least one low catalytic metal in a range of from 1 to 10% by weight.

4,415,878
PARTIAL PRESSURE OF OXYGEN SENSOR-III

Robert F. Novak, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,412
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 **5 Claims**



1. A partial pressure of oxygen sensor for insertion into an exhaust system of a hydrocarbon fuel burning device, comprising in combination:
a mounting body formed of a metallic material threaded on one end for securement to the exhaust system and having a cylindrical configured bore of a first diameter extending along a central axis thereof;

a heated sensing element including: a ceramic support of generally circular cross section having a pair of openings extending therethrough, a sensing element supporting wire having (a) a pair of leg portions extending through said pair of openings of said ceramic support, and (b) a support portion intermediate said leg portions thereof in juxtaposition to a free end of said ceramic support, a titania dioxide sensing element mounted upon said support portion of said sensing element supporting wire, a resistance heater element wrapped around said ceramic support so that said resistance heater element heats said sensing element to a required temperature when a preselected voltage is applied across said resistance heater element, and a locating ring bonded to a rear portion of said heated sensing element, said heated sensing element having a diameter slightly less than said first diameter of said cylindrical configured bore of said mounting body so that said heated sensing element may be received within said cylindrical configured bore with said locating ring locating said heated sensing element in a manner such that said titania dioxide sensing element thereof extends beyond said cylindrical bore of said threaded end of said mounting body;

a first protection tube secured to said threaded end of said mounting body for protecting said titania dioxide heating element, said first protection tube having openings therein for permitting exhaust gases to pass therethrough and come into contact with said titania dioxide sensing element;

a plurality of fine electrical lead lines, a pair of said fine lead lines being bonded to and extending from said resistance heater element and a pair of said fine lead lines being bonded to and extending from said sensing element supporting wire;

a plurality of electrical lead lines equal in number to said fine electrical lead lines;

a plurality of crimped bands, each of said crimped bands for interconnecting paired ones of said electrical lead lines and said fine electrical lead lines;

a ceramic insulator body having a plurality of passageways therein equal in number to said plurality of said crimped bands, said passageways being so constructed and arranged that each of said passageways have an associated pair of said interconnected leads passing therethrough with said crimped band interconnecting the same coming into locating engagement with the side walls defining said associated passageway;

a second protection tube means having one end secured to an end of said mounting body not having said threads thereon for enclosing and protecting said ceramic insulator body and elements received therein and passing therethrough;

a ceramic cement occupying a volume between said ceramic insulator body and a rear portion of said heated sensing element received in said cylindrical configured bore of said mounting body;

a high temperature resistant sealant material occupying a volume between said ceramic insulator body and a free end of said second protection tube means; and

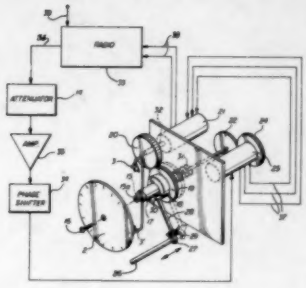
electrical terminal means connected to said plurality of electrical lead lines for independently connecting said lead lines as required to a source of voltage and to a sensing current.

4,415,879

AIRCRAFT FLIGHT INSTRUMENT DISPLAY SYSTEM

Robert H. Brady, Houston; Michael L. Beaumont, Deer Park, and Arthur C. Pettis, Houston, all of Tex., assignors to Aviation Instrument Manufacturing Corporation, Austin, Tex.

Filed Mar. 2, 1981, Ser. No. 239,422
Int. Cl.³ G08G 5/00; B64D 45/04
U.S. Cl. 340—27 NA **22 Claims**



1. An aircraft indicator apparatus for providing heading and course information integrated in one instrument comprising:

(a) a gyro for providing heading information,

(b) a compass card,

(c) a direct drive means connecting said gyro and said compass card,

(d) compass setting means for independently setting said compass card and erecting and caging said gyro,

(e) course selector means clutch coupled to said compass card for adjusting the desired course without caging said gyro, independently of said compass card and gyro.

4,415,880

CHARACTER RECOGNITION METHOD AND APPARATUS

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 28, 1980, Ser. No. 115,986
Int. Cl.³ G06K 9/46
U.S. Cl. 382—27 **17 Claims**

1. A method of character recognition of a character from a memory means arranged in columns and rows of pixels, comprising the steps of:

(a) forming a window around an unknown character, the window being defined by the memory addresses of at least two of the corners;

(b) assigning a weight number to each pixel within the window;

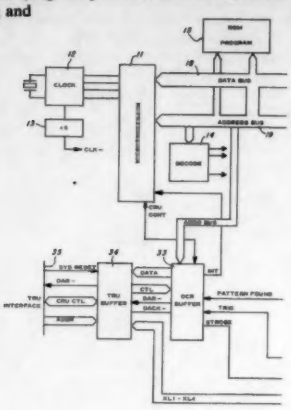
(c) penetrating the window by counting pixels inwardly from each side for predetermining rows, and from top and bottom of the window for predetermined columns until a transition from white (0) to black (1) occurs;

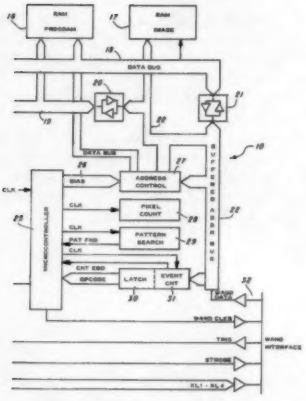
(d) summing the white pixel weight numbers for each penetration until the transition occurs to form a sum for the total number of penetrations from each side and from top and bottom of the window;

(e) combining the sums;

(f) categorizing the combination;

(g) identifying the possible characters from the categorization; and





(h) comparing the possible characters from the categorization with the unknown character until a match is made.

4,415,881

DIGITAL-TO-ANALOG CONVERTER

Robert Lechner, Otterfing, and Klaus Wintzer, Munich, both of Fed. Rep. of Germany, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 184,775

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938947

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **3 Claims**

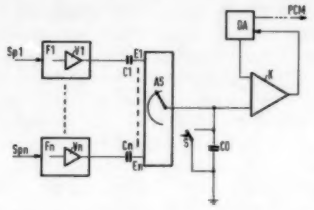
1. In an analog-to-digital converter for consecutively converting analog signals received in parallel on a plurality of incoming lines into corresponding binary encoded digital output signals, the improvement comprising:

(a) a plurality of filter circuits for band pass filtering of incoming analog signals, each having an input connected to a respective incoming line, and an output and including a filter capacitor connected to said output;

(b) a selector unit having a plurality of signal inputs, each input being connected to a respective one of said filter capacitors, and an output for delivering a sampling signal received from a presently through-connected incoming line during a respective sampling interval;

(c) a grounded network connected to said output of said selector unit and comprising a storage capacitor and a switch arranged in parallel to said storage capacitor for temporarily short-circuiting said capacitor after each sampling interval; and

(d) a comparator having a first and a second input and an output, said first input being connected to said output of



said selector unit and said second input being supplied by an analog reference voltage source;

wherein said grounded network is designed such that it is capable of both storing a sampling signal during the corresponding sampling interval, and simulating a common resistance consecutively associated with a respective one of the filter capacitors to form an individually dedicated resistor-capacitor filter circuit during each of the sampling intervals.

4,415,882

ANALOG TO DIGITAL CONVERTER

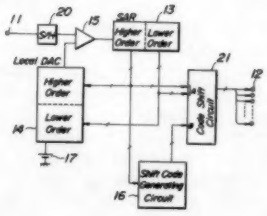
Yukio Akazawa, Iruma; Yasuyuki Matsuya, Tokyo, and Atsushi Iwata, Tokorozawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,121

Claims priority, application Japan, Jul. 31, 1981, 56-108136

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **8 Claims**



1. An analog to digital converter comprising:

a successive approximation register;

a local digital to analog converter having

a first digital to analog converter for generating an output of higher order bits, said first digital to analog converter including a first capacitor array having capacitors arranged with binary weighting corresponding to a train of higher order bits of a digital code from said successive approximation register and a first analog switch array having analog switches for selectively connecting one terminal of each of said capacitors of said first capacitor array to an analog input, a reference voltage or ground;

a second digital to analog converter for generating a full scale output as an output of lower order bits which is always larger than every quantizing level of said first

digital to analog converter, said second digital to analog converter including a second capacitor array having capacitors arranged with binary weighting corresponding to a train of lower order bits of said digital code and a second analog switch array having analog switches for selectively connecting one terminal of each of said capacitors of said capacitor array to said analog input, the reference voltage or ground, the other terminals of said capacitors in said first capacitor arrays being connected in common to an output point of said first digital to analog converter and the other terminals of said capacitors in said second capacitor array being connected in common to an output point of said second digital to analog converter; and

a coupling capacitor coupling the output points of said first and second digital to analog converters, the equivalent capacitance formed by said second digital to analog converter and said coupling capacitor across the output point of said first digital to analog converter being larger than the unit capacitance of said first digital to analog converter, said first and second analog switch arrays controlling sampling and holding of said analog input signal, and the output of said first digital to analog converter being added to the output of said second digital to analog converter to provide an analog output of said local digital to analog converter;

a comparator for comparing the ground potential with said analog output from said local digital to analog converter, said successive approximation register being coupled to the output of said comparator and having a higher order portion and a lower order portion corresponding to said first and second digital to analog converters for performing successive approximations in accordance with the output from said comparator to store said digital code having a higher order portion and a lower order portion;

means for coupling the higher and lower order portions of said successive approximation register to said first and second analog switch arrays;

a shift code generating circuit coupled to the higher order portion of said successive approximation register for storing a shift code for shifting said higher order portion of said digital code previously allotted to each digital code from said successive approximation register, an actual digital to analog conversion characteristic in said local digital to analog converter thereby being calibrated for an ideal digital to analog conversion characteristic, said shift code generating ciruit further generating a shift code in response to said higher order portion of said digital code from said successive approximation register; and

a code shift circuit coupled to said successive approximation register and said code shift generating circuit for digitally shifting said higher and lower order portions of said digital code from said successive approximation register in accordance with said shift code from said shift code generating circuit to generate an analog to digital conversion output signal.

4,415,883

CIRCUIT ARRANGEMENT FOR CONVERTING DIGITAL SIGNALS IN PARTICULAR PCM SIGNALS, INTO CORRESPONDING ANALOG SIGNALS WITH A R-2R CHAIN NETWORK

Frithjof von Sichart, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 54,412, Jul. 3, 1979, abandoned. This application Sep. 17, 1981, Ser. No. 303,122

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838310

Int. Cl.³ H03K *13/02*

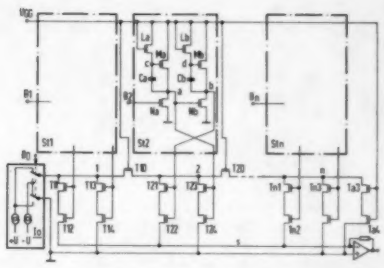
U.S. Cl. 340—347 DA **2 Claims**

1. In a circuit arrangement for converting multibit digital signals intoo analog signals, of the type in which a R-2R ladder network includes series resistors each having a resistance value R and shunt resistors each having a resistance value 2R, the improvement therein comprising:

a constant current feed connected to one end of said ladder including a first pole connected to a junction point of a shunt resistor and the adjacent series resistor at the end of the ladder and a second pole connected to a reference terminal;

an additional 2R resistor terminating the opposite end of the ladder network;

the shunt resistors divided into first and second pairs on each side of a series resistor; a sum line connected to a first shunt resistor of each pair at the ends opposite to those ends connected to a series resistor and said reference terminal connected to the second shunt resistor of each pair at the end which is not connected to a series resistor, said sum line and said reference terminal providing an analog signal output;



each of the resistors of the R-2R ladder network comprising identical metal-oxide-semiconductor transistors with each series resistor formed of a single transistor with its source and sink constituting the terminals of the resistor, and each shunt resistor comprises two of the transistors connected in series so that the source of one and the drain of the other constitute terminals of the respective 2R resistor, said metal-oxide-semiconductor transistors all integrated on a chip;

the transistors forming the shunt resistors being divided into two groups in which the one group is constituted by the first resistors and the second group is constituted by the second resistors; and

said transistors of said series resistors including gates connected to an operating voltage for providing constant conduction and the transistors of said shunt resistors connected to receive signals representing the digital signals to be converted.

4,415,884

DIAGNOSTIC CIRCUIT FOR PROGRAMMABLE LOGIC SAFETY CONTROL SYSTEMS

Michael A. Delin, West Simsbury, and Jack A. Schuss, West Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

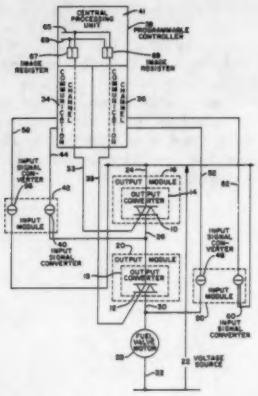
Filed Oct. 7, 1981, Ser. No. 309,287

Int. Cl.³ G08B *23/00*

U.S. Cl. 340—500 **18 Claims**

1. In a programmable controller based logic system having an alarm system for alarming malfunctions, an alternating current voltage source, first and second image registers, electronic input and output modules, said output modules containing solid state switches capable of switching the output module load power, and first and second output module solid state switches connected in series to energize and deenergize an energize-to-start, deenergize-to-stop field device, a method of operating a programmable controller based logic system comprising:

a. monitoring said first image register, said second image register and the integrity of the series combintion of said first and second solid state switches;
b. independently of and simultaneously with step (a), monitoring said first image register and the integrity of said first solid state switch;



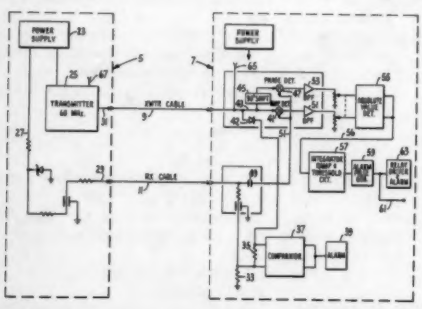
c. independently of steps (a) and (b), monitoring intermittently said second image register and the integrity of said second solid state switch; and
d. alarming an unsafe condition whenever said monitoring indicates the failure of said first image register. and second image register, said first solid state switch, said second solid state switch or the series combination of said first solid state switch and said second solid state switch.

4,415,885

INTRUSION DETECTOR

Ronald W. Mongeon, San Jose, Calif., assignor to Stellar Systems, Inc., San Jose, Calif.

Filed May 21, 1981, Ser. No. 265,903
Int. Cl.[3] G08B *13/24*
U.S. Cl. 340—552 **7 Claims**



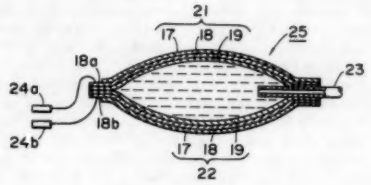
1. An intrusion alarm system comprising in combination:
a. RF generator and means for feeding an unmodulated output from said generator to a leaky transmission line,
b. a leaky receiving line roughly paralleling said transmission line and leading to a receiver,
c. means for feeding a DC voltage through said receiving line,
d. rectifying means for developing a DC voltage from the RF on said transmission line,
e. first alarm means comprising a comparator for comparing the DC voltages from (c) and (d) and sounding an alarm if the voltages differ substantially from a target value,
f. second alarm means comprising:
(i) means for feeding the RF output from the receiving line to an inphase detector,
(ii) means for shifting the phase of the RF output 90° and feeding the phase shifted output to a quadrature detector,
(iii) feeding the output of the inphase and quadrature detectors to an absolute value detector which acts as an OR gate whereby
(iv) said second alarm means actuated by a perturbation in either the inphase or quadrature detectors.

4,415,886

RESIDUAL INK DETECTION MECHANISM

Hiroshi Kyogoku, Yokohama; Shigemitsu Tazaki, Matsudo; Koji Terasawa, Mitaka, and Shigeru Okamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,505
Claims priority, application Japan, Aug. 12, 1980, 55-109805
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—618 **5 Claims**



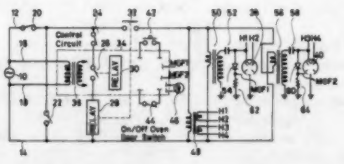
1. A residual ink detection mechanism, comprising:
an ink housing case made of a flexible material and being formed into a closed bag which deforms in accordance with the amount of ink therein, said ink housing case having at least two electrodes with each one provided at opposite portions of said ink housing case;
a pair of contacts each one of said pair of contacts connected to a different electrode; and
means connected to said pair of contacts, for detecting the amount of ink in said ink housing case by detection of the electrostatic capacity between said electrodes.

4,415,887

MAGNETRON FAULT ALARM IN A MICROWAVE OVEN

Yoshitaka Kawase, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 14, 1981, Ser. No. 254,172
Claims priority, application Japan, Apr. 17, 1980, 55-51276
Int. Cl.[3] G08B *21/00*; H05B *6/64*
U.S. Cl. 340—635 **5 Claims**



1. A fault condition alarm system in a microwave oven which includes an oven door, a plurality of magnetrons and a plurality of detection means associated with each of said plurality of magnetrons for developing a detection signal when

the magnetron is placed in a fault condition, said fault condition alarm system comprising:

first determination means for developing a first determination signal when a said detection signal is not developed from any of said plurality of detection means, said first means developing a second determination signal when at least one detection signal is developed from one of said plurality of detection means;

door condition monitoring means for monitoring whether said oven door is open or closed;

second determination means responsive to said first determination means and said door condition monitoring means for developing a control signal when said second determination signal is developed and said door is determined to be closed; and

display means responsive to said control signal derived from said second determination means.

4,415,888

MONITORING DEVICE FOR MACHINE PARTS

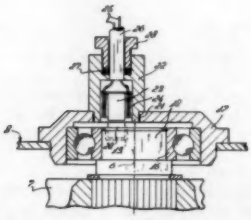
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 4,539, Jan. 18, 1979, abandoned. This application Dec. 29, 1980, Ser. No. 221,032

Claims priority, application Netherlands, Jan. 20, 1978, 7800715

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—684 **11 Claims**



1. A ground working machine comprising a frame, a portion of said frame mounting a plurality of soil working tools, driving means connected to rotate said tools about respective upwardly extending axes defined by corresponding shafts for said tools, monitoring means adjacent said driving means and said monitoring means including an electrical generating device in a circuit, said device independently generating electrical current to a signal element in said circuit responsive to the rotational movement of a said shaft of at least one of said tools, said shaft having an upper end journalled in a bearing supported by a bearing housing at the upper side of said frame portion, said device comprising two parts including an inductance part and a permanent magnet part, said magnet part being held in a bore in said upper shaft end and positioned off center with respect to the said axis of said shaft's rotation, said inductance part being mounted in the top of said bearing housing, located adjacent and above said upper shaft end, said inductance part being positioned off center with respect to the shaft axis of rotation whereby the rotational movement of said shaft relative to said inductance part generates a current during the normal rotation of said tool shaft and said signal element is actuated.

4,415,889

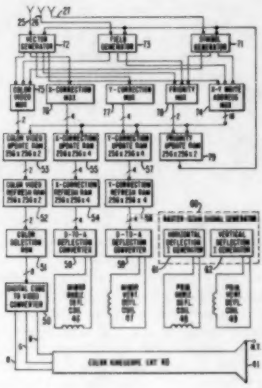
RASTER-SCANNED CRT DISPLAY SYSTEM WITH IMPROVED POSITIONAL RESOLUTION FOR DIGITALLY ENCODED GRAPHICS

William J. Davis, Thousand Oaks, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1980, Ser. No. 217,843

Int. Cl.³ G09G *9/16*

U.S. Cl. 340—728 **13 Claims**



1. A raster-scanned display system with improved positional resolution comprising:

a cathode ray tube provided with an electroluminescent screen and with a first electron gun connected for responding to a first video signal to project a first electron beam of varying intensity towards its screen;

a raster scanning signal generator means for generating recurrent first and second deflection current signals varying at respective sweep rates that are relatively slow and relatively fast respective to each other;

a first principal deflection winding connected to conduct said first deflection current signal and arranged for responding to said first deflection current signal to deflect each electron beam of said cathode ray tube to sweep its screen in directions parallel to a first axis;

a second principal deflection winding connected to conduct said second deflection current signal and arranged for responding to said second deflection current signal to deflect each electron beam of said cathode ray tube to sweep its screen in directions parallel to a second axis orthogonal to the first;

means for generating a stream of individual pixel information as digital code words;

means for applying said first video signal to said cathode ray tube responsive to a first portion of each digital code word;

means responsive to a second portion of each digital code word for generating a first minor deflection signal capable of varying at video rate; and

first auxiliary deflection means for responding to said first minor deflection signal to deflect each electron beam of said cathode ray tube in directions parallel to said first axis across its screen by amounts smaller than the sweeps parallel to said first axis afforded by said first principal winding in the interval between successive sweeps in said second direction.

4,415,890

CHARACTER GENERATOR CAPABLE OF STORING CHARACTER PATTERNS AT DIFFERENT ADDRESSES

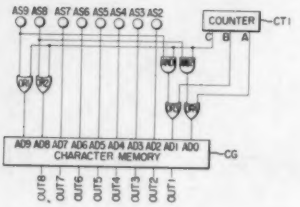
Sadao Iwakura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,734

Claims priority, application Japan, May 31, 1979, 54-73664[U]

Int. Cl.³ G09G 1/16

U.S. Cl. 340—749 5 Claims


AS9 AS8 AS7 AS6 AS5 AS4 AS3 AS2
COUNTER
CT1
C B A
AD9 AD8 AD7 AD6 AD5 AD4 AD3 AD2 AD1 AD0
CHARACTER MEMORY
CG
OUT8 OUT7 OUT6 OUT5 OUT4 OUT3 OUT2 OUT1

1. A character generator capable of storing character patterns at different addresses, comprising:

(a) memory means for storing character patterns corresponding to characters, each of said character patterns including a plurality of elements, an element of each plurality of elements comprising one of said character patterns being stored at a location in said memory means separate and spaced from the location of storage in said memory means of the remainder of said plurality of elements comprising said one of said character patterns;

(b) signal generating means for generating signals corresponding to the number of said plurality of elements;

(c) address signal generating means for generating address signals for obtaining access to each of said character patterns stored in said memory; and

(d) address conversion means for gaining access to each element of each of said character patterns stored in said memory means in accordance with said address signals generated by said address signal generating means and the signals generated by said signal generating means.

4,415,891

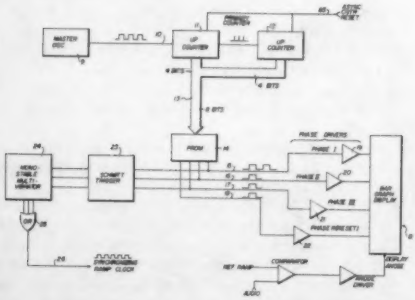
PROGRAMMABLE SCAN CONTROL CIRCUIT FOR PROVIDING BAR GRAPH DISPLAY PANEL WITH SELECTED SCALES AND MARKER BARS

Thomas M. Hay, III, Fort Lauderdale, Fla., assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,599

Int. Cl.³ G09G 3/06

U.S. Cl. 340—753 8 Claims



1. A programmable display device comprising a bar graph display panel having an anode and a series of spaced cathodes connected in groups defining phases and a reset cathode at one end of said series; and a scan control circuit for said panel including a first programmable memory means having an output for providing a clocking waveform including a plurality of phase pulses and a reset pulse, clocking means for addressing said first programmable memory means to develop said plurality of phase pulses and said reset pulse in a repeating cathode scanning cycle, means including second programmable memory means operated synchronously with said phase pulses for generating an analog ramp voltage of a slope and dynamic range determined by said second programmable memory means, comparator means for comparing said ramp voltage to a d.c. voltage representing an audio program level to provide an output voltage for energizing said anode in each said cathode scanning cycle for an interval thereof in which said d.c. voltage exceeds said ramp voltage, and means for applying said phase pulses and said reset pulse to said series of cathodes in each said cathode scanning cycle to provide a glow in said bar graph display panel during the energization of said anode with the length of such glow being representative of said d.c. voltage.

4,415,892

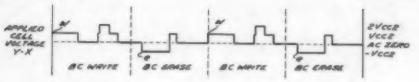
ADVANCED WAVEFORM TECHNIQUES FOR PLASMA DISPLAY PANELS

Michael J. Marentic, Orange, Calif., assignor to Interstate Electronics Corporation, Anaheim, Calif.

Filed Jun. 12, 1981, Ser. No. 273,094

Int. Cl.³ G09G 3/28

U.S. Cl. 340—767 28 Claims



1. A brightness control circuit for an AC plasma panel system, comprising:

means for generating a plurality of partial waveforms;

means for assembling groups of said partial waveforms sequentially to generate complex waveforms for driving a cell of said panel; and

means for controlling said assembly means to select and combine partial waveforms into said complex waveforms to provide different levels of light emission.

4,415,893

DOOR CONTROL SYSTEM

Manfred W. Roland, Mountain View, and Max G. Roland, Redwood City, both of Calif., assignors to All-Lock Electronics, Inc., New Brunswick, N.J.

Continuation of Ser. No. 919,703, Jun. 27, 1978, abandoned. This application Mar. 16, 1981, Ser. No. 243,739

Int. Cl.³ H04Q 9/00

U.S. Cl. 340—825.31 12 Claims

1. A door control system for selectively controlling the locking and unlocking of a plurality of doors, comprising:

a door locking means at each of said doors for locking or unlocking that door,

a door control means located at each of said doors for operating the door locking means at that door to unlock that door,

each said door control means including:

(1) a microprocessor having means for storing a plurality of key codes, any one of which is capable of permitting unlocking of the door locking means at that door,

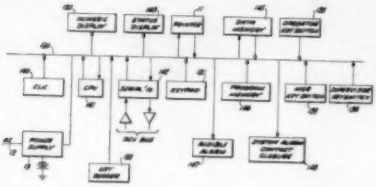
(2) key receiving means for receiving a key having a predetermined code thereon, key reading means for sensing that code and comparing means for comparing

that code to the said code or codes stored in the microprocessor of that door, said sensing and comparing means being operable by referring to the microprocessor of that door control means, whereby upon matching of a key code and a code stored in that microprocessor, a signal is generated to unlock the door locking means,

(3) a battery means for operating its respective microprocessor, to generate a signal, in the absence of external power,

(4) said key receiving means including means for operating the unlocking means to unlock the door, by manual movement of the key, while still in the key receiving means, after said signal has been generated, and

a master control means located at a master station remote from said doors, means for providing two way electrical communication between the master control means and all of said door control means, said two way communication



including means for transmitting from each door control means to the master control unit (a) a return signal verifying the code stored at that door control means and (b) an information signal concerning a condition in the vicinity of that door control means, said master control means having means for reading the code of a key which has a predetermined key code thereon, and said master control means further having:

(1) means for causing a first predetermined key code to be stored in any one door control means of the system,

(2) means for causing one or more additional predetermined key codes to be stored in a group of door control means of the system, and

(3) means for cancelling any predetermined key code from the memory of a single door control means, from the memories of any group of door control means or from the memories of all said door control means.

4,415,894

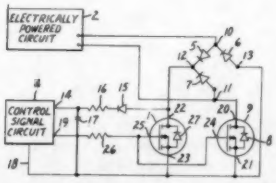
SWITCHING CIRCUITRY FOR LOAD CONTROL UTILIZING MOS-FETS

Daryl D. Dressler, and Jimmy L. Fiala, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 27, 1982, Ser. No. 453,276

Int. Cl.[3] **H04Q** *9/00;* **H03K** *17/00*

U.S. Cl. 340—825.57 **2 Claims**



1. An improved switching circuit for supplying d.c. power from an electrically powered circuit to a control circuit, the control signal circuit having an output providing logic 1 or logic 0 signals, the switching circuit including a full-wave rectifier having four diodes with the input of the full-wave rectifier connectable for energization from the electrically powered circuit, the output of the full-wave rectifier connectable to the control signal circuit via a power storage circuit portion and a switch means connected to the full-wave rectifier, the switch means having a control electrode connectable to the output of the control signal circuit, said switch means operable in response to the presence of a logic 1 signal presented to the control electode for establishing a low impedance path across the input of the full-wave rectifier, the improvement including two power metal-oxide-semi-conductor field-effect transistors connected for providing the function of the switch means plus that of at least one of the four diodes of the full-wave rectifier, each of said power metal-oxide-semiconductor field-effect transistors having a drain electrode, a source electrode, a gate electrode, the source electrodes of said metal-oxide-semiconductor field-effect transistors connected together to provide one output connection for the full-wave rectifier with at least one of the drain electrodes connected to the full-wave rectifier to connect one of said two power metal-oxide-semiconductor field-effect transistors for providing a diode function in the full-wave rectifier, and said gate electrodes connectable to the output of the control signal circuit providing logic 1 or logic 0 signals, said power metal-oxide-semiconductor field-effect transistors responsive to a logic signal from the control signal circuit to establish the low impedance path across the input to the full-wave rectifier.

4,415,895

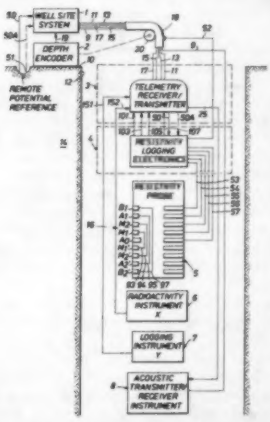
WELL LOGGING DATA TRANSMISSION SYSTEM

Jack J. Flagg, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 11, 1981, Ser. No. 233,355

Int. Cl.[3] **G01V** *1/40, 3/13;* **E21B** *29/02*

U.S. Cl. 340—856 **19 Claims**



1. Apparatus for investigating the subsurface earth materials traversed by a logging sonde along a borehole, comprising

a logging sonde,

surface telemetry means for generating and receiving logging information signals, said surface telemetry means comprised of first generator means for generating first pulsed acoustic logic logging information signals at said surface and first pulse receiver means for receiving second pulsed logging information signals from said sonde,

subsurface telemetry means disposed within said sonde for said generating and receiving logging information signals, said subsurface telemetry means comprised of second pulse generator means for generating digital pulse code modulated signal as said second signals at said sonde,

second pulse receiver means for receiving said first signals, and

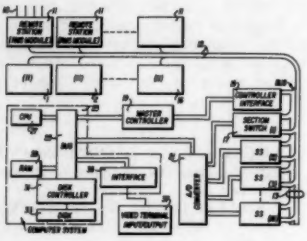
transmission means comprised of first conductor means electrically connected between said surface and subsurface telemetry means for transmitting pulsed signals correlative to said first and second signals between said surface telemetry means and said subsurface telemetry means, and second conductor means for simultaneously transmitting a low level analog potential signal as a third logging signal between said surface telemetry means and said subsurface telemetry means.

4,415,896

COMPUTER CONTROLLED ENERGY MONITORING SYSTEM

Marvin D. Allgood, Oxon Hill, Md., assignor to ADEC, Inc., Oxon Hill, Md.

Filed Jun. 9, 1981, Ser. No. 272,011
Int. Cl.³ G08C *19/00, 19/04, 19/10;* G08B *21/00*
U.S. Cl. 340—870.03 **84 Claims**



1. A data communications system comprising:

at least one communications channel;

at least one group of remote stations connected to a respective communications channel, each remote station comprising a plurality of information channels and tone addressable means for selectively connecting one of said plurality of information channels to a respectively communications channel, said tone addressable means comprising a tone detector for detecting clock tones on a respective communications channel, counting means for counting the number of clock tones detected, means for connecting one of said information channels to the respective communications channel in accordance with the number of clock tones which are counted, and means for enabling said connecting means only when the number of clock tones detected falls within a predetermined numerical range;

a central station connected to each said communications channel and comprising means for sequentially supplying clock tones in common to each said communications channel to cause sequential connection of the information channels at said remote stations to a respective communications channel associated therewith, and means for transmitting a signal to or receiving a signal from an information channel which is connected to a respective communications channel.

4,415,897

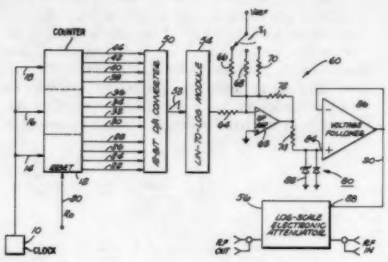
PRECISION CONTROL OF RF ATTENUATORS FOR STC APPLICATIONS

Henry R. Kennedy, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 21, 1981, Ser. No. 265,957
Int. Cl.³ G01S *7/34*
U.S. Cl. 343—5 SM **19 Claims**

17. A radar system which transmits pulsed radio frequency signals and receives radio frequency echo signals following said transmitted pulses in time, including a sensitivity-time control device operative on said received radio frequency signals to apply a varying attenuation within the receiving time period following each of said transmitted pulses, comprising:

first means responsive to a reset signal marking the beginning of each receiving period following each corresponding transmitter pulse and to a source of clock pulses for generating a digital word of progressively changing value during at least a portion of said receiving time period;



second means responsive to said first means digital word for generating an analog signal which is a logarithmic function of said progressive values of said digital word and including means for varying the rate of change of said analog signal; and

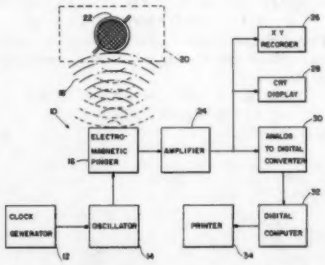
third means in series with the radio frequency path conducting said received radio frequency signals, said third means being controllable to produce an RF attenuation which is a logarithmic function of said second means analog signal.

4,415,898

METHOD OF DETERMINING THE MATERIAL COMPOSITION OF A DIELECTRICALLY COATED RADAR TARGET/OBSTACLE

Guillermo C. Gaunaurd, Rockville, Md., and Herbert Überall, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1981, Ser. No. 278,294
Int. Cl.³ G01S *13/00*
U.S. Cl. 343—5 SA **4 Claims**



1. A method of determining the material properties of a target/obstacle comprising the steps of:

directing electromagnetic energy in the form of incident wave pulses having a known frequency spectrum at said target/obstacle creating thereon, electromagnetic oscillations including a set of modal resonances superposed thereon;

receiving a portion of said incident wave pulses backscat-

tered from said target/obstacle and conditioning it into representative electrical signals;

converting said electrical signals into an echo pattern ("radar cross-section") of said target/obstacle, said echo pattern being a plot of squared scattering amplitudes versus normalized frequency;

subdividing said echo pattern into its partial-wave resonance components, each corresponding to a particular resonance mode;

determining the background components of said partial-wave resonance components, said background components being the resonance response of a perfectly conducting scatterer of the same size of said target/obstacle, and said background components being obtained from said partial-wave components by setting the modal impedances (Z_n) and admittances (Y_n) equal to zero (0) and infinity (∞), respectively;

substracting each of said background components from each of said partial-wave resonance components of the same particular resonance mode, thereby isolating the resonances in the frequency spectrum which are the fundamental frequency and its overtones for each modal contribution; and

measuring the asymptotic spacings between any two consecutive modal overtones and the asymptotic widths of any two consecutive modal overtones, said asymptotic spacings and said asymptotic widths being used to obtain the dielectric constant and the thickness of the coating layer covering the conducting core of said target/obstacle.

4,415,899

MONITOR FOR AN INSTRUMENT-LANDING SYSTEM

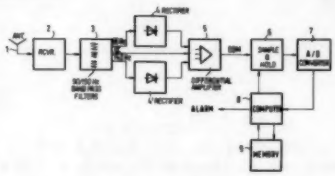
Horst Vogel, Korntal; Horst Idler, Stuttgart, and Arno H. Taruttis, Ludwigsburg, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 98,807, Nov. 30, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,216

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852506

Int. Cl.³ G01S *1/16*

U.S. Cl. 343—413 **3 Claims**



1. A monitor for a localizer of an instrument landing system, said localizer being of the type which radiates a pair of beams, one modulated at a first low frequency and the other at a second low frequency, the relative depths of modulation of each of said low frequencies detected in a receiver aboard an aircraft on landing approach providing a measure of the deviation of said aircraft from a desired landing course, said monitor comprising:

first means for receiving the radiations of said localizer and for developing a signal which is a continuous function of the difference in depth of modulation of said first and second low frequencies on said received radiations;

second means for repetitively sampling and differentiating said continuous function to produce a frequency spectrum function $S(\omega)$;

third means responsive to the second means sampled values to identify differences of depth of said modulation in excess of a predetermined threshold;

and fourth means activated by a signal corresponding to an over threshold signal from said third means for determining the absolute maximum of said $S(\omega)$ in the range $0 \leqq \omega \leqq \pi$ and for generating an equipment error alarm when said absolute maximum occurs at $\omega = 0$.

4,415,900

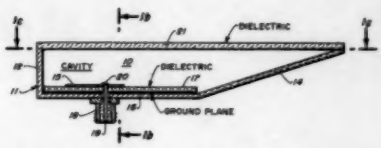
CAVITY/MICROSTRIP MULTI-MODE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1981, Ser. No. 335,308

Int. Cl.³ H01Q *1/38*

U.S. Cl. 343—700 MS **17 Claims**



1. A waveguide cavity and microstrip multi-mode antenna system for providing control over and for producing complex and improved radiation patterns, comprising:

a. a section of rectangular waveguide being closed at each end and having an opening in one broad surface thereof to form a cavity therein;

b. a microstrip radiating element being formed above a ground plane at the bottom of said waveguide cavity; said microstrip radiating element being spaced from said ground plane by a dielectric substrate;

c. said microstrip radiating element being fed from a single coaxial-to-microstrip adapter the center pin of which passes through the bottom of said waveguide to the radiating element feedpoint;

d. said microstrip radiating element being excited by microwave energy via said coaxial-to-microstrip adapter and in turn said microstrip radiating element exciting said waveguide cavity in a predetermined manner;

e. the forward end of said waveguide cavity being closed with a ramp formation which acts to aid propagration of radiating waves in a foreward direction, thereby reducing reflection from an abrupt continuity due to a square end closure.

4,415,901

LOW POWER BEAM SWITCHABLE ANTENNA ARRANGEMENT

Michael J. Gans, Monmouth Beach, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 21, 1981, Ser. No. 303,837

Int. Cl.³ H01Q *19/06, 19/17*

U.S. Cl. 343—754 **2 Claims**

1. A low power, beam switchable, antenna arrangement comprising:

a focusing reflector (**14**) comprising a predetermined aperture and being capable of converting a spherical wavefront into a planar wavefront at the aperture thereof; and

a plurality of feedhorns (10_1–10_N), each feedhorn being capable of radiating a spherical wavefront (**12**) in a beam of electromagnetic energy for reflection by the focusing reflector into a planar wavefront (**16**) at the aperture thereof

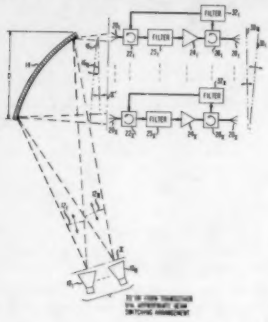
characterized in that

the plurality of feedhorns are disposed beside each other on a surface (Σ) adjacent to but not forming part of a focal surface of the focusing reflector, and the beams of electromagnetic energy capable of being radiated by the plurality of feedhorns are each of a low power level, the antenna arrangement further comprising:

an amplifying array comprising:

a plurality of first feed elements (20_1–20_X) forming a first planar array disposed to cover the aperture of, and be directed at, the focusing reflector on a fourier transform surface (Σ') of the surface on which the plurality of feed-horns are disposed for receiving a planar wavefront reflected by the focusing reflector;

a plurality of second feed elements (28_1–28_X) forming a second planar array corresponding in configuration to the first planar array and disposed to cover the aperture of, and directed away from, the focusing reflector; and



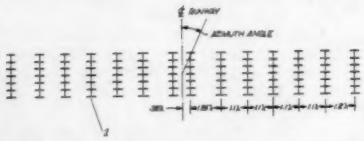
a plurality of amplifying means (24_1–24_X), each amplifying means interconnecting a separate corresponding feed element of the first and second planar arrays and being capable of amplifying a low power signal with its associated phase shift as received at the associated first feed element to a predetermined high power level for radiation by the associated second feed element of the second planar array to a remote destinational receiver.

4,415,902

ARRAY FOR REDUCING THE NUMBER OF ANTENNA ELEMENTS FOR RADIATING INSTRUMENT LANDING SYSTEM LOCALIZER SIGNALS

Robert W. Redlich, Athens, Ohio, assignor to The Government of the United States, Washington, D.C.

Filed Apr. 29, 1981, Ser. No. 258,793
Int. Cl.³ H01Q *21/06*
U.S. Cl. 343—844 **1 Claim**



1. A linear array of antennas for the purpose of radiating Instrument Landing System Localizer signals at a wavelength λ, said array being characterized by the combination of;

(a) a course sideband radiation pattern having peaks at angles $\pm\theta_o$ from a line perpendicular to the line of said array, θ_o being typically between three and five degrees,

(b) average spacing S between antennas such that S exceeds λ, with the consequence that spurious interferometer lobes appear in the course sideband array factor of said array at angles $\pm\psi$ from a line perpendicular to the line of said array, ψ being determined from the formula

$$\psi=\sin^{-1}(\lambda/S-\sin\theta_o),$$

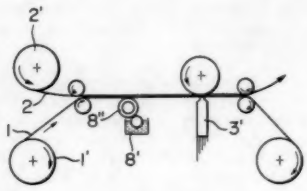
(c) endfire antennas whose radiation pattern in a direction perpendicular to the line of said array is at least 12 decibels higher than the radiation from said antennas in a direction at said angle ψ from a line perpendicular to the line of said array.

4,415,903

ELECTRIC INK TRANSFER RECORDING METHOD

Toshiyuki Kawanishi, and Yukio Tabata, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,812
Claims priority, application Japan, Apr. 16, 1981, 56-57514
Int. Cl.³ G01D *9/00, 15/10*
U.S. Cl. 346—1.1 **6 Claims**



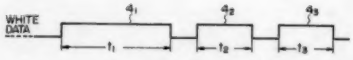
1. An electric ink transfer recording method for obtaining a recorded matter which comprises putting together a sheet to be recorded and an ink sheet generating Joule's heat when electrified and having a thermo-melting ink layer; applying electricity to said ink sheet by contacting a return circuit electrode with the ink sheet and a recording electrode needle with the surface of the ink sheet and impressing pulse voltage thereupon; and transferring the ink from the ink sheet to the sheet to be recorded, characterized in that an insulating liquid is interposed between the ink sheet and the recording electrode needle when obtaining the recorded matter.

4,415,904

THERMAL HEAD DRIVING METHOD

Toshiharu Inui, and Haruhiko Moriguchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1982, Ser. No. 372,353
Claims priority, application Japan, Apr. 30, 1981, 56/65488
Int. Cl.³ G01D *9/00, 15/10*
U.S. Cl. 346—1.1 **7 Claims**



1. In a method of driving a thermal head of a heat-sensitive recording device by applying driving energy at a first of two discrete energy levels, said thermal head being utilized to perform heat-sensitive recording of picture signals in a printing line onto a recording sheet which is in contact with said thermal head, the improvement comprising; detecting an occurrence of one or more non-print lines wherein no printing is to be carried out, and increasing said driving energy supplied to said thermal head from said first level to a second level for a plurality of printing lines to be printed immediately following said one or more non-print printing lines.

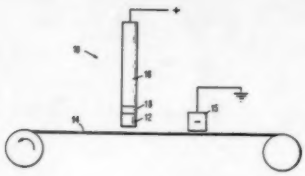
4,415,905
ELECTROLYTIC PRINTING PROCESS WITH WEAR RESISTANT ELECTRODE

Joseph W. Mitchell, Montrose; Merrill W. Shafer, Yorktown Heights, and Carlos J. Sambucetti, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 164,388, Jun. 30, 1980. This application Feb. 10, 1983, Ser. No. 465,236

Int. Cl.³ C25B *11/10, 11/08*

U.S. Cl. 346—1.1 **7 Claims**



1. In a process for electrolytic printing on a printing medium, the improvement comprising:

using an electrode having a region which is an oxide of metal from the group of Ru, Ir, Rh, Pt or an alloy thereof, said oxide region being at an extremity of the electrode which during printing is in close proximity to the printing medium.

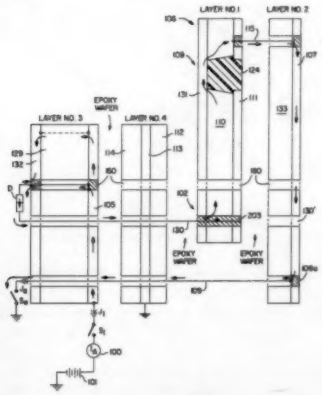
4,415,906
MAGNETIC RECORDING HEADS

Houshang Rasekhi, Convent Station, N.J.; Alfred M. Nelson, Redondo Beach, Calif.; James P. Johnston, Wharton, N.J.; Frederick A. Rupinski, Lyndhurst, N.J., and Walter B. Hatfield, Jr., Fair Haven, N.J., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jul. 17, 1981, Ser. No. 284,045

Int. Cl.³ G01D *15/12*

U.S. Cl. 346—74.5 **35 Claims**



1. In a recording system having recording circuitry, the integral structure comprising a first member defining a multiplicity of recording elements arranged substantially in parallel with one another, each recording element having a defined recording zone of minute size forming a part of a first surface of said first member, with the recording zones of said recording elements being predeterminably arranged relative to one another; and a second member having a first surface which is contiguous at least in part with said first member, said second member also having a ground plane on a second surface thereof with said ground plane positioned to substantially reduce inductance in the recording circuitry, and wherein the electrical resistance and inductance within said integral structure is substantially the same for each recording element.

4,415,907
PRINTING PULSE CONTROL CIRCUIT FOR THERMAL PRINTING HEAD

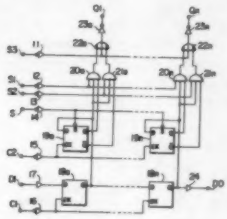
Noboru Suemori, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1981, Ser. No. 318,394

Claims priority, application Japan, Nov. 7, 1980, 55-155952; Jun. 19, 1981, 56-93847

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **4 Claims**



1. A printing pulse control circuit for a thermal printing head comprising:

n-bit latch circuits adapted to serially store an input data;

latch circuits with set terminals adapted to store each bit information of said latch circuits as parallel information;

a combination of first and second AND circuits which delivers out a first strobe signal of a larger pulse width when both the serial information stored in said latch circuits and said parallel information stored in said latch circuits with set terminals represent a first bit information and selects, in respect of each bit, a second strobe signal of a smaller pulse width than that of said first strobe signal when the serial information and the parallel information represent first and second bit informations, respectively;

OR circuits each connected to make the logical sum of the corresponding one of the outputs of said first and second AND circuits and a third strobe signal applied as a preheat pulse; and

inverter drive circuits each connected to the corresponding one of the outputs of said OR circuits,

said latch circuits, latch circuits with set terminals, first and second AND circuits, OR circuits and inverter drive circuits being integrally formed on a single silicon chip.

4,415,908
THERMAL PRINTER

Kenitiro Sugiura, Funabashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 269,884, Jun. 3, 1981, abandoned. This application Jul. 2, 1982, Ser. No. 394,790

Claims priority, application Japan, Jun. 13, 1980, 55-78964

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **10 Claims**

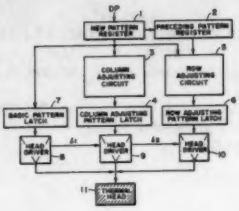
1. Thermal printer comprising:

(a) a thermal head having a plurality of heat generating sections to record a pattern on a recording sheet;

(b) a pattern memory for recording pattern information to selectively drive said plurality of heat generating sections in said thermal head;

(c) adjusting means connected to said pattern memory, to discriminate said pattern informations for selectively driving at least three adjacent heat generating sections out of

said plurality of heat generating sections in said thermal head, and to generate adjusting pattern information which drive two heat generating sections out of said three heat generating sections; and



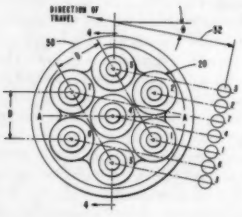
(d) means connected to said memory and said adjusting pattern means for supplying said pattern information stored in said pattern memory and said adjusting pattern informations to said thermal head.

4,415,909

MULTIPLE NOZZLE INK JET PRINT HEAD

Victor J. Italiano, Ithaca, and Steven P. Sayko, Dryden, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 26, 1981, Ser. No. 314,913
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R 8 Claims



1. An ink jet print head comprising a housing and a plurality of print actuators arranged in a generally circular symmetrical pattern and including tubular members having nozzles axially parallel therewith and equally spaced whereby time of actuation of the respective actuators is time delayed to enable serial printing and equal dot spacing of dot matrix characters in columnar manner on record media spaced from said nozzles during travel of the print head in one direction.

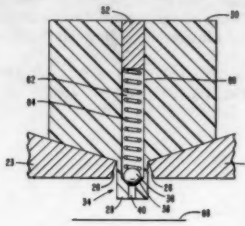
4,415,910

INK JET TRANSDUCER

John W. Reece, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 25, 1982, Ser. No. 342,256
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R 7 Claims

1. An ink jet printing element comprising a housing having a nozzle at one end thereof,
means for supplying ink into said housing,
valve means including a sloping seat portion formed at one end of the nozzle and a valve member operably associated with the seat portion, and
electromagnetic means including opposed magnetic pole portions positioned for actuating said valve member to



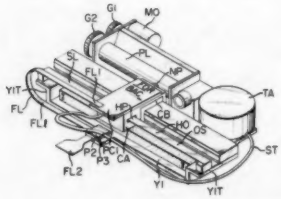
open said valve means and allow ejection of droplets of ink from said nozzle.

4,415,911

RECORDING APPARATUS

Shigemitsu Tazaki, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 154,906, May 30, 1980, abandoned.
This application Jul. 29, 1982, Ser. No. 403,014
Claims priority, application Japan, Jun. 8, 1979, 54-72614
Int. Cl.³ G01D *15/24*
U.S. Cl. 346—140 R 6 Claims



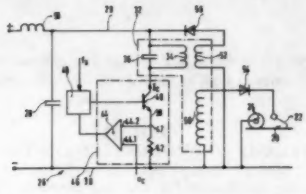
1. A high speed recording apparatus comprising:
linear motor means;
a carriage driven reciprocally by said linear motor means and having a printing head thereon;
a graduation plate connected to said linear motor means and positioned along the reciprocal movement path of said carriage;
a graduation detecting means provided on said carriage for generating signals indicative of the position and advancing speed of said carriage along said graduation plate; and
control means for controlling the movement of said carriage, which control means includes means for sensing the position and the advancing speed of said carriage from the signals generated by said graduation detecting means, means for regulating the advancing speed in accordance with the sensing means when said carriage is advanced in a predetermined direction, and means for disabling the regulating means when the advancement of said carriage is in a direction other than the predetermined direction.

4,415,912

RECORDING METHOD AND RECORDING APPARATUS TO RECORD, ON A GREY SCALE, REPRESENTATIONS OF IMAGES UNDER CONTROL OF ELECTRICAL COMMAND SIGNALS

Stefan Kudelski, Le Mont-sur-Lausanne, and Jean-Claude Schlup, Cheseaux-sur-Lausanne, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 6, 1981, Ser. No. 223,000
Int. Cl.³ G01D *15/08*; H04N *1/22*
U.S. Cl. 346—154 **20 Claims**



8. Apparatus for recording images in grey-scale representation of a variable command signal (U_c) on a recording medium (16) having an insulating substrate (19) and a metallized coating (20) thereon, said apparatus including a recording electrode (22), means (18) passing said recording carrier beneath the recording electrode with the metallized coating in contact therewith, an electrical pulse generator (26) connected to said electrode (22) to form a writing circuit therewith and applying burn-out pulses to the electrode to burn out a portion of the metallized coating contacted by the electrode,

and modulating means to modulate the burn-out pulses as a function of the desired burn-out surface of the zone being burned out beneath the electrode,

comprising

a storage means (32) storing electrical pulses from the pulse generator (26) and coupled to the electrode (22),

said storage means including a voltage generating means (32) for providing pulses to said electrode, and thus providing electrical energy to the electrode under control of and as a function of said command signal,

said storage means storing and providing said pulses at a level which enables the energy to be released at a voltage level which is at least as high as that required for vaporization or sublimation of metal beneath the electrode;

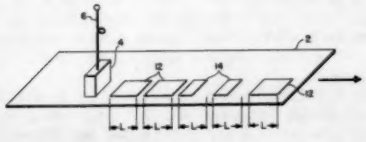
and a control unit (46) connected to said command signals and to said storage means and controlling the energy being stored in the storage means (32) as a function of said command signal.

4,415,913

GRAY TONE RECORDER

Paul A. Diddens, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 8, 1981, Ser. No. 271,169
Int. Cl.³ G01D *15/06*; H04N *1/22*
U.S. Cl. 346—154 **16 Claims**



12. A recorder comprising

an electrode means for recording on a recording medium,

recording medium transport means for transporting a recording medium past said electrode means at a predetermined speed,

electrode drive means connected to said electrode means for energizing said electrode to produce said recording in response to a control signal,

input signal means for storing an input signal and

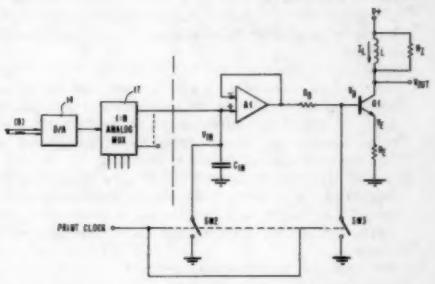
control signal means connected to said input signal means for developing said control signal to have a duration representative of said input signal whereby said electrode drive means is actuated during said control signal to energize said electrode means to produce a corresponding length of a recording by said electrode means along the direction of movement of the recording medium during the movement of the recording medium past said electrode means by said transport means.

4,415,914

GRAY SCALE ELECTROSTATIC RECORDING SYSTEM AND A STYLUS DRIVER THEREFOR

Francis P. Giordano, Scarsdale, and Robert J. Henshaw, New City, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 278,965
Int. Cl.³ G01D *15/06*; H04N *1/22*
U.S. Cl. 346—154 **12 Claims**



1. An electrostatic gray scale printing system comprising means for moving a dielectric recording medium past a recording station,

said recording station including a plurality of conductive printing styli disposed to establish a scan line transverse to the direction of motion of said recording medium,

a conductive platen located adjacent to said styli,

said conductive platen and said styli being effective when suitably actuated to establish a charging path for placing an electrostatic charge on discrete areas of said recording medium immediately adjacent to selected styli,

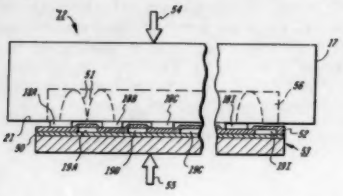
inductive pulse forming means selectively connectable to said styli for producing variable high voltage gray scale pulses for forming electrostatic images of a variable magnitude on said recording medium from a low voltage power supply,

said pulse forming means further including transistor means operable with said low voltage power supply to establish a current through an inductor included in said inductive pulse forming means proportional to variable input signals supplied thereto and means for interrupting the current flow through said transitor to produce an inductively generated output pulse across said inductor proportional to the current flowing therethrough.

4,415,915
MULTILAYER INTERLEAVED ELECTRODES FOR MULTIGATE LIGHT VALVES

Robert A. Sprague, Saratoga, and Lawrence N. Flores, Soquel, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1981, Ser. No. 248,939
Int. Cl.³ G01D *15/14*; G02F *1/01*
U.S. Cl. 346—160 **10 Claims**



6. An electro-optic line printer comprising the combination of

a multigate light valve including

an optically transparent electro-optic element having a reflecting surface disposed between an input face and an output face, and

plural layers of electrodes stacked one upon another closely adjacent the reflecting surface of said electro-optic element, each of said layers including a plurality of spaced apart, electrically insulated electrodes which are interleaved with and electrically insulated from the electrodes of each of the other layers, the electrodes of each of said layers being distributed widthwise of said electro-optic element,

means for illuminating substantially the full width of said electro-optic element with a light beam, said light beam being applied to said electro-optic element at a grazing angle of incidence relative to said reflecting surface and being brought to a wedge shaped focus on said said surface for total internal reflection therefrom,

means for applying successive sets of data samples to said electrodes for creating fringe fields which sequentially spatially modulate said light beam in accordance with respective picture elements for successive lines of an image,

a photosensitive recording medium, and

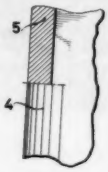
means aligned between said electro-optic element and said recording medium for converting the spatial modulation of said light beam into a corresponding intensity profile, whereby successive lines of said image are sequentially printed on said recording medium.

4,415,916
GERMANIUM SEMICONDUCTING RADIATION DETECTOR WITH PHOSPHORUS IMPLANTED N+ CONTACT

Davor Protic, Jülich, and Georg Riepe, Mechernich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,232
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1979, 2924569
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—29 **9 Claims**

1. A semiconductor nuclear radiation detector of the PIN diode type operable up to field intensities of more than 2500 V per cm, comprising a body of high-purity germanium and an n^+ contact region produced therein by a first high energy implantation doping with phorphorus ions of an energy of at least 25 kV at a dose magnitude below 10^{14} ions/cm^2 followed by a second implantation of phosphorus ions of a dose of at least 10^{14} ions/cm^2 and of an energy level not exceeding 20 kV, said body having an annealed lattice structure at least in the deep zones of high energy implantation, and the phosphorus

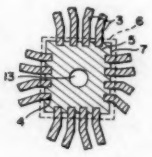


concentration in the region of said first implantation being at least 10^3 times as high as that of the substrate material.

4,415,917
LEAD FRAME FOR INTEGRATED CIRCUIT DEVICES

Hiroshi Chiba, and Shoichi Ogura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd. and Sumitomo Metal Mining Company Limited, both of Tokyo, Japan

Filed Aug. 17, 1981, Ser. No. 293,130
Claims priority, application Japan, Aug. 20, 1980, 55-114185
Int. Cl.³ H01L *29/60, 23/48*
U.S. Cl. 357—70 **5 Claims**



1. A lead frame for an integrated circuit device, said lead frame including support strips; a plurality of leads which have outer ends and inner ends, the outer ends of the leads being connected to the support strips and the inner ends extending toward the center of the lead frame; and a removable body element positioned at the center of the lead frame, the body element including recesses in its outer periphery, in the tips of the inner ends of the leads being positionable in the recesses to prevent their being displaced with respect to one another.

4,415,918
DIGITAL COLOR TELEVISION SIGNAL DEMODULATOR

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,556
Int. Cl.³ H04N *9/50*
U.S. Cl. 358—23 **12 Claims**

1. In a television receiver, including a source of color reference signals, and a source of digital chrominance signals, a color signal demodulator and filter arrangement comprising:

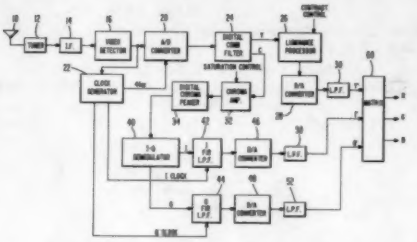
means for producing a first clock signal having a first phase relationship with respect to said color reference signal;

means for producing a second clock signal having a second phase relationship with respect to said color reference signal;

a first digital filter having inputs responsive to said digital chrominance signal and said first clock signal, and an output at which a first demodulated and filtered color mixture signal is produced, including a first tapped shift register arrangement through which samples of said digital chrominance signal are shifted in response to said first clock signal; first weighting means coupled to taps of said

first shift register for weighting signals on said taps; and means for combining said tap weighted signals produced by said first weighting means and having an output at which said first demodulated and filtered color mixture signal is produced; and

a second digital filter having inputs responsive to said digital chrominance signal and said second clock signal, and an output at which a second demodulated and filtered color



mixture signal is produced, including a second tapped shift register arrangement through which samples of said digital chrominance signal are shifted in response to said second clock signal; second weighting means coupled to taps of said second shift register for weighting signals on said taps; and means for combining said tap weighted signals produced by said second weighting means and having an output at which said second demodulated and filtered color mixture signal is produced.

4,415,919

COLOR SIGNAL PROCESSING CIRCUIT OF COLOR TELEVISION RECEIVER

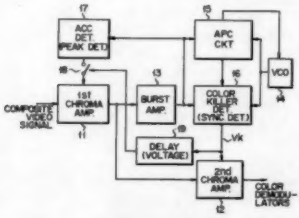
Yoji Miyasako; Takashi Sugimoto, both of Yokohama, and Toru Tanaka, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 2, 1981, Ser. No. 307,873

Claims priority, application Japan, Oct. 8, 1980, 55-141001

Int. Cl.³ H04N *9/49, 9/535*

U.S. Cl. 358—26 **3 Claims**



1. A color signal processing circuit of a color television receiver comprising:

a first chroma amplifier for separating a carrier chroma signal from a composite color video signal;

a second chroma amplifier coupled to said first chroma amplifier;

a burst amplifier for separating a color burst signal from an output signal of said first chroma amplifier;

a synchronous detector type color killer circuit responsive to said burst amplifier to cut off said second chroma amplifier when the amplitude of the color burst signal from said burst amplifier is small and to turn ON said second chroma amplifier when the amplitude of the color burst signal reaches a predetermined level, a control output voltage level of said color killer circuit increasing with an increase in the amplitude of the color burst signal;

a peak detector type automatic chroma control circuit for controlling the gain of said first chroma amplifier in response to said burst amplifier; and

circuit means responsive to said color killer circuit for initiating the operation of said automatic chroma control circuit when the control output voltage level of said color killer circuit reaches a second voltage level which is higher than a first voltage level at which said second chroma amplifier turns ON.

4,415,920

IMAGE SIGNAL PROCESSING UNIT

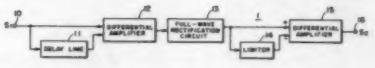
Yuzo Kato; Nobuyoshi Tanaka, both of Yokohama; Naoto Kawamura, Inagi; Hisashi Nakatsui, Kawasaki; Shunichi Ishihara, Kodaira, and Yasushi Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 301,777

Claims priority, application Japan, Sep. 19, 1980, 55-129209; Sep. 19, 1980, 55-129210

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—37 **21 Claims**



1. An image signal processing unit, comprising:

a contour extraction processing circuit for extracting a contour image signal representing a contour part of an image from an input image signal;

a color signal conversion processing circuit for converting the contour image signal into an image signal for causing simultaneous contrast phenomenon between a color represented by the converted image signal and a color represented by an ambient image signal representing an ambient part of the image adjacent the contour part; and

an image conversion processing circuit for producing a contour emphasized image signal from the input image signal and an output signal from said color signal conversion processing circuit.

4,415,921

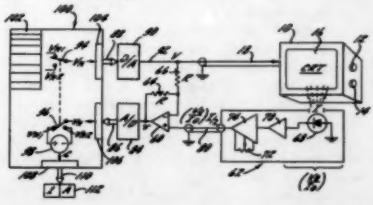
AUTOMATIC CALIBRATION SYSTEM FOR VIDEO DISPLAYS IN VISION TESTING

Patrick Mulvanny, Evanston, and Scott Bartky, Chicago, both of Ill., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Oct. 30, 1981, Ser. No. 316,737

Int. Cl.³ H04N *7/02*

U.S. Cl. 358—139 **17 Claims**



1. A calibration circuit for indicating the error in intensity adjustment of a video display driven by video drive signal comprising, in combination:

light sensor means generating a photometer signal in response to illumination from the video display;

comparator means comparing the photometer signal to the video drive signal for generating an error signal indicative of the error in intensity adjustment of the video display, said comparator means comprising differential amplifier means having an output signal proportional to a difference between the video drive signal and the photometer signal;

digital to analog converter means having a digital control signal input and an analog output generating the video drive signal in response to the logic states on the digital control signal input, and having a response time at least as short as the low frequency response time of the video display to the video drive signal; and

digital sampling means for intermittently sampling and storing a digital representation of the comparator means output signal, and having a sampling response time at least as short as the low-frequency response time of the video display to the video drive signal,

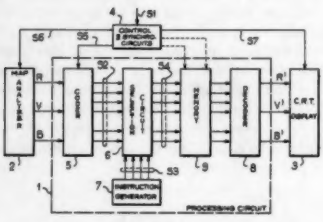
so that the difference between sampled and stored comparator output signals in response to alternating logic states on the digital control signal input indicates the error in the contrast adjustment of the video display, and the sum of the sampled and stored comparator output signals in response to alternating logic states on the digital control signal input indicates the error in the brightness adjustment of the video display.

4,415,922

CARTOGRAPHIC INDICATOR

Jean C. Reymond, and Maurice Gontier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 1, 1980, Ser. No. 174,693
Claims priority, application France, Aug. 7, 1979, 79 20229
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—22 **4 Claims**



1. A cartographic indicator for aerial navigation, comprising:

a support for a carrier of a map showing details of overflown terrain in a limited number of distinctive colors;

scanning means confronting said support for analyzing the map point by point and feeding respective analog input signals to three video channels, said input signals representing intensity levels of corresponding color components;

coding means connected to said video channels for digitizing said input signals;

memory means connected to said coding means for receiving the digitized signals therefrom;

operator-controlled selection means directly coupled to said memory means independently of said coding means for emitting instructions suppressing digital information pertaining to undesired color components, said memory means reading out a stored data word in response to unsuppressed data received for any scanned point of the map from said coding means;

decoding means connected to said memory means for reconverting the read-out data word into three analog output signls determining the chromatic composition of an image of the scanned point; and

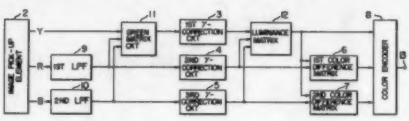
CRT display means connected to said decoding means for visualizing a point-by-point image of a scanned map portion on a screen under the control of said output signals.

4,415,923

SIGNAL PROCESSING CIRCUIT

Masaru Noda, Fujisawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,058
Claims priority, application Japan, Aug. 25, 1980, 55-115957
Int. Cl.³ H04N *9/04, 9/07*
U.S. Cl. 358—41 **10 Claims**



1. A signal processing circuit for a color video camera, comprising:

photoelectric conversion means for producing a luminance signal, a red color signal and a blue color signal from incoming light signal;

first and second low-pass filters for allowing said red color signal and said blue color signal to pass therethrough, respectively;

a first arithmetic operation circuit for combining the output signal from said first low-pass filter, the output signal from said second low-pass filter and said luminance signal to thereby produce a pseudo-green color signal having a low frequency component which corresponds to that of a green color signal;

first, second and third gamma-correction circuits for processing said pseudo-green color signal, the output signal from said first low-pass filter and the output signal from said second low-pass filter, respectively; and

a second arithmetic operation circuit for combining the output signals from said first, second and third gamma-correction circuits, respectively, thereby to produce a gamma-corrected luminance signal.

4,415,924

PHOTOELECTRIC TRANSDUCER DEVICE

Takashi Kawabata, Kamakura; Takao Kinoshita, Tokyo; Nobuhiko Shinoda, Tokyo; Shinji Sakai, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

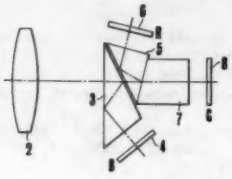
Filed Mar. 19, 1981, Ser. No. 245,349
Claims priority, application Japan, Mar. 22, 1980, 55-36765
Int. Cl.³ H04N *9/04*
U.S. Cl. 358—50 **4 Claims**

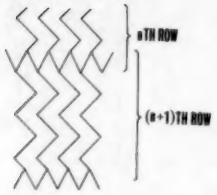
1. An image pick-up device comprising:

(a) a color separation optical system which separates an incident light beam into a plurality of light beams having different colors; and

(b) a plurality of solid state image pick-up devices each arranged so as to receive the light beams separated by the color separation optical system, and each having a plurality of photoelectric elements arranged in a matrix pattern

in rows and columns, each photoelectric element having a light receiving surface, whereby light receiving surface of





adjacent photoelectric elements form an overlapping zone at least in one direction along the row or the column.

4,415,925

COLOR ORIGINAL READOUT APPARATUS

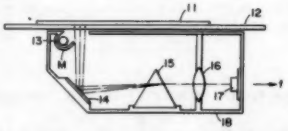
Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1982, Ser. No. 342,766

Claims priority, application Japan, Feb. 5, 1981, 56-16215; Feb. 6, 1981, 56-16408

Int. Cl.³ H04N *1/46*

U.S. Cl. 358—75 **11 Claims**



1. A color original readout apparatus comprising:

radiating means for radiating an original with light of different spectra;

an image sensor for reading out an image of the original produced by light reflected theretoward from the original;

means for causing relative movement between the original and said image sensor while the image is being read out; and

spectroscope means for making optical paths of the light reflected from the original toward said image sensor different according to the spectra of the reflected light so that light of different spectra reflected from any one position on the original during said relative movement with respect to said image sensor is incident on said image sensor.

4,415,926

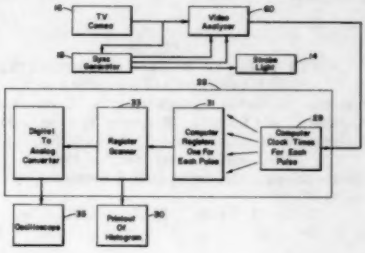
INSPECTION OF ELONGATED MATERIAL

James W. Henry, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1982, Ser. No. 382,990

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—107 **4 Claims**



1. Method of characterizing crimped tow for subsequent identification or quality control comprising the steps of

(a) obtaining length measurements of the individual crimps in a sample of said tow,

(b) graphically representing the measurement distribution of a sufficient quantity of said tow until a pattern is established,

(c) using the pattern established in step (b) as a standard against which other tow is compared.

4,415,927

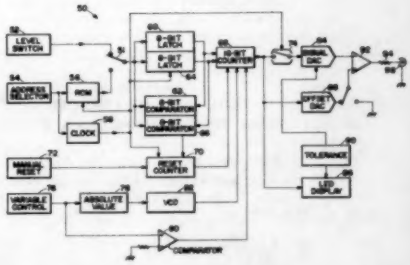
CALIBRATION REFERENCE SIGNAL GENERATOR

Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 13, 1981, Ser. No. 310,957

Int. Cl.³ H04N *7/02*

U.S. Cl. 358—139 **8 Claims**



1. A signal generator, comprising

means for generating amplitude data in the form of a multibit digital signal,

means for generating a rectangular waveform signal having a reference level and a second level derived from said digital signal,

means for converting at least the most significant bit of said digital signal to a corresponding analog signal, and

means for offsetting said rectangular waveform signal an amount corresponding to the value of said analog signal.

2. Apparatus for calibrating a video test signal generator, comprising a signal generator according to claim 1, and a waveform monitor having first and second inputs and operable in a differential input mode, said signal generator having an output at which the offset rectangular waveform is provided

and which is connected to said first input of the waveform monitor, so that when a test signal generated by the test signal generator is applied to the second input of the waveform monitor the waveform monitor provides a first display of the waveform of the test signal which is offset by an amount corresponding to the value of said analog signal and a second display of the waveform of the test signal which is spaced from the first display by an amount corresponding to the amplitude of said rectangular waveform signal.

4,415,928

CALCULATION OF RADIAL COORDINATES OF POLAR-COORDINATE RASTER SCAN

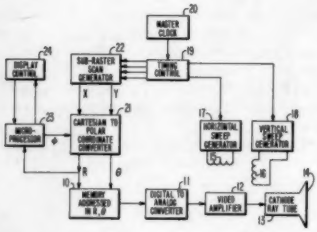
Christopher H. Strolle, Philadelphia, Pa.; Terrence R. Smith, Clementon, and Glenn A. Reitmeier, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,092

Claims priority, application United Kingdom, Jan. 26, 1981, 8102281

Int. Cl.³ H04N *5/02, 5/14;* **G09G** *1/16*

U.S. Cl. 358—140 **21 Claims**



10. In combination:

means for supplying a stream of x, y Cartesian coordinates;

means responsive to said stream of x, y Cartesian coordinates for calculating the sums of their squares; and

a read-only memory conducted to respond to the sums of their squares greater than a limit value corresponding to a sum of the squares of substantial values of x and y, for supplying a function related to the radial coordinates that are the square roots of those sums.

4,415,929

VIDEO CLAMP CIRCUIT

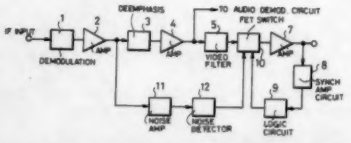
Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 311,064

Claims priority, application Japan, Oct. 15, 1980, 55/144202

Int. Cl.³ H04N *5/19*

U.S. Cl. 358—171 **2 Claims**



1. In a video signal processing circuit for removing an energy diffusion signal from a broadcasting satellite signal superposed with said energy diffusion signal, means including a video clamp circuit including a switching circuit for establishing the level of a clamping signal for removing said energy diffusion signal, means including a noise detection circuit for detecting the level of noise contained in said satellite signal, and means receiving the output from said noise detection circuit for reducing the level of the clamping signal of said switching circuit when the level of noise in said satellite signal exceeds a predetermined level.

4,415,930

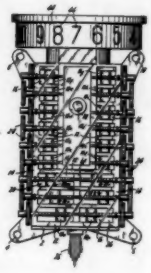
ADJUSTABLE POTENTIOMETER ASSEMBLY FOR TUNING MULTI-BAND TELEVISION RECEIVERS

Hans Schmidt, Wood Dale, and Robert A. Wolff, Lombard, both of Ill., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 6, 1982, Ser. No. 337,488

Int. Cl.³ H04N *5/44*

U.S. Cl. 358—191.1 **10 Claims**



1. In a television receiver, including a television tuner having varactor diodes responsive to predetermined tuning voltages selectively applied thereto for tuning the television receiver to a desired television channel, an adjustible potentiometer assembly for establishing tuning voltages for selection of television channels, comprising: a housing, a substrate mounted in said housing, a plurality of distributed resistive elements equal in number to the number of channels to be selected formed on said substrate in at least one row, each of said resistive elements being arranged with a tuning area to permit a predetermined tuning voltage to be selectively coupled from said tuning area of said resistive elements to the varactor diodes in the television receiver for selecting a desired television channel, and a plurality of voltage pickup members adjustibly contacting said distributed resistive elements for selectively coupling the tuning voltages to the varactor diodes, said resistive elements being positioned on said substrate such that all of said tuning areas are aligned so that said voltage pickup members can be readily adjusted to provide appropriate tuning voltages for selection of each channel.

4,415,931

TELEVISION DISPLAY WITH DOUBLED HORIZONTAL LINES

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,612

Int. Cl.³ H04N *5/68*

U.S. Cl. 358—242 **7 Claims**

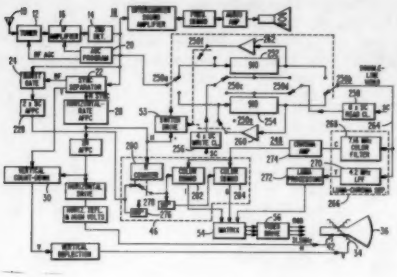
1. A television raster display apparatus arranged for reducing visibility of the line scans, comprising:

a source of composite line-scan television signals, said line-scan signals recurring at a first rate and including synchronizing signals and image information;

doubling means coupled to said source of television signals for generating two substantially identical sequential line-scan signals from each line-scan signal from said source, said doubling means thereby doubling the frequency of said image information and also doubling the recurrence rate to form said two identical line-scan signals at a second recurrence rate; and

display means coupled to said doubling means for displaying

the output signal therefrom at said second recurrence rate thereby displaying each line-scan of signals from said



source twice whereby the visibility of said line-scans is reduced.

4,415,932

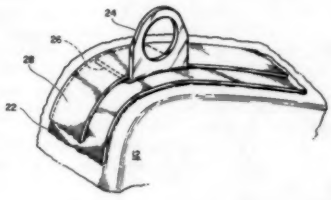
CRT MOUNTING AND IMPLOSION-PROTECTION MEANS AND METHOD

Melvin F. Rogers, Western Springs, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed May 21, 1982, Ser. No. 380,510

Int. Cl.³ H01J *61/50;* **H04N** *5/645*

U.S. Cl. 358—246 **17 Claims**



1. In a cathode ray tube having a substantially rectangular glass face panel with a rearwardly extending skirt, said tube having improved mounting and implosion-protection means comprising:

a first tension band having a predetermined relatively wide width for compressively inwardly loading said panel at a tension level completely effective to protect against implosion;

four mounting brackets, one at each corner of said panel for mounting said tube, each bracket having a rearwardly extending foot;

a second tension band substantially narrower than said first band for circumscribing and overlaying said first band, and tensioned at a level 55 to 78 percent of the tension level of said first band for capturing and compressively holding each bracket foot against said first band;

such that the tension level of said second band is effective to retain said mounting brackets, but ineffective to deleteriously interfere with the implosion protective tension exerted on said panel by said first band.

4,415,933

CARRIER WAVE RECOVERY CIRCUIT

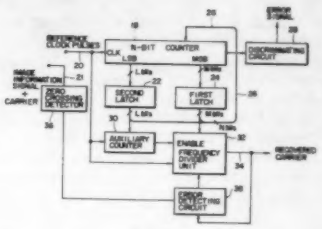
Tomio Murayama; Fumio Miyao, both of Kanagawa; Shigefumi Takeuchi, and Kazumi Tsukioka, both of Nagano, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,704

Claims priority, application Japan, Dec. 18, 1979, 54-163594; Dec. 18, 1979, 54-163595

Int. Cl.³ H03K *5/13;* **H03L** *7/00;* **H04N** *1/36*

U.S. Cl. 358—281 **11 Claims**



1. A carrier signal recovery circuit comprising:

N-bit counter means for counting reference clock pulses for a period corresponding to 2^L cycle periods of a received carrier signal, where N and L are integers;

a first latch circuit operatively connected to first outputs of said N-bit counter for holding an upper M most significant bits of a count produced by said N-bit counter means;

a second latch circuit operatively connected to second outputs of said N-bit counter means for holding a lower N−M least significant bits of said count produced by said N-bit counter means;

frequency divider means operatively connected to said first latch circuit and having a frequency dividing ratio corresponding to one cycle period of said received carrier signal, said frequency dividing ratio being initially set by outputs of said first latch circuit; and

second counter means operatively connected between said second latch means and said frequency divider, said second counter means providing an output to said frequency divider means for correcting said frequency dividing ratio, a recovered carrier signal being outputted from said frequency divider.

4,415,934

IMAGE READING APPARATUS

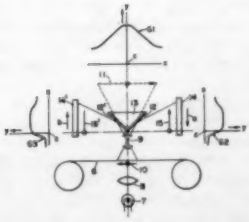
Motofumi Konishi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 319,880

Claims priority, application Japan, Nov. 19, 1980, 55-162980; Feb. 16, 1981, 56-21132; Feb. 16, 1981, 56-21133

Int. Cl.³ H04N *1/04, 1/18*

U.S. Cl. 358—294 **14 Claims**



1. An image reading apparatus for reading linearly by photo-

electric converting means an image of an original which is divided into at least two parts relative to a main scanning direction, said apparatus comprising:

optical means for focusing the image of the original on a focusing plane;

optical path dividing means for dividing, along the main scanning direction, a projecting optical path of the image of the original into at least two optical paths, the optical path dividing means having at least one reflecting surface disposed in association with a part of the main scanning region of the original, wherein the diverging part of the optical paths divided by said reflecting surface extends in a direction intersecting the main scanning direction;

said photoelectric converting means including at least two line sensors for scanning the original in the main scanning direction, wherein a line sensor is disposed at each of the focusing planes of the divided optical paths; and

means for moving the original and said line sensors, relative to each other, in an auxiliary scanning direction which is perpendicular to the main scanning direction, for scanning the original in the auxiliary direction.

4,415,935

TANGENTIAL SERVO CONTROL SIGNAL GENERATING DEVICE FOR RECORDED DATA REPRODUCING DEVICE

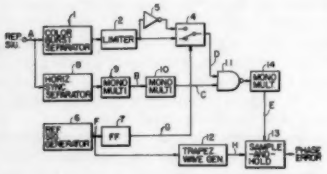
Koichi Suzuki, Saitama, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 168,231

Claims priority, application Japan, Jul. 12, 1979, 54-88848; Dec. 12, 1979, 54-161195

Int. Cl.³ H04N 9/44

U.S. Cl. 358—320 **9 Claims**



1. A tangential servo control signal generating device for generating a tangential servo control signal for correcting time base variations in a regenerative color signal reproduced from recorded data in a recorded data reproducing device comprising:

means for providing a regenerative horizontal synchronizing signal from said regenerative color signal;

means for providing a regenerative color burst signal from said color signal for each period of said regenerative horizontal synchronizing signal;

color burst signal generating means for providing a color burst output signal by phase inverting said regenerative color burst signal every other period of said regenerative horizontal synchronizing signal and passing said regenerative color burst signal directly for periods of the regenerative horizontal synchronizing signal other than said every other period of said regenerative horizontal synchronizing signal;

means operating in response to said color burst output signal for providing a detection signal a predetermined time after the start of each burst of said color burst output signal;

means for providing a reference signal synchronized with said regenerative horizontal synchronizing signal; and

means for comparing relative phases of said detection signal and said reference signal for producing an error signal indicative of a phase difference between said detection signal and said reference signal, said error signal forming said tangential servo control signal.

4,415,936

JITTER COMPENSATION SYSTEM IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

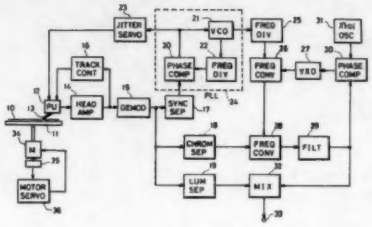
Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 26, 1981, Ser. No. 296,490

Claims priority, application Japan, Aug. 28, 1980, 55-117785

Int. Cl.³ H04N 9/44

U.S. Cl. 358—322 **4 Claims**



1. A jitter compensation system in a reproducing apparatus having a reproducing transducer including a reproducing element for reproducing a color video signal from a rotary recording medium, said color video signal having a carrier chrominance signal which has been converted into a low frequency range, said jitter compensation system comprising:

separation means for separating a horizontal synchronizing signal from the color video signal which is reproduced by said reproducing transducer;

carrier chrominance signal separation means for separating a carrier chrominance signal from the color video signal reproduced by said reproducing transducer;

first voltage controlled oscillator means;

first phase comparator means and said voltage controlled oscillator means constituting a phase locked loop;

said first phase comparator being jointly responsive to said separation means and to said oscillator means for comparing phases of the separated horizontal synchronizing signal and the output signal of said voltage controlled oscillator means for supplying an output error signal to said voltage controlled oscillator means in order to control the oscillation frequency thereof;

displacing means responsive to the output error signal of said phase comparator means, for displacing the reproducing element of said reproducing transducer toward a relative scanning direction with respect to said rotary recording medium;

first frequency converter means responsive to said carrier chrominance signal separating means for frequency-converting the frequency of said separated carrier chrominance signal back to the original frequency; and

means responsive to the outputs of said voltage controlled oscillator means and said first frequency converter means for producing a signal for frequency conversion which is to be supplied to said frequency converter;

said first frequency converter means producing a signal having a frequency which is equal to the difference in frequencies from said signal for frequency conversion and said separated carrier chrominance signal, as a carrier chrominance signal having the original frequency,

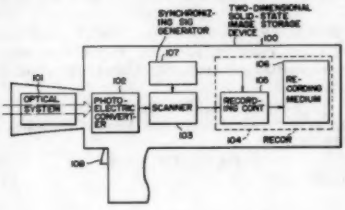
said means for producing a signal for frequency conversion comprising second frequency converter means responsive to the output oscillation signal of said first voltage controlled oscillator means, reference signal oscillator means, second phase comparator means jointly responsive to said first frequency converter means and to said reference signal oscillation means for comparing phases of output signals of said first frequency converter means and said reference signal oscillator means, and a second voltage

controlled oscillator means responsive to said second phase comparator means for controlling the oscillation frequency thereof and for supplying an output oscillation signal to said second frequency converter means as a signal for frequency conversion, said output signal of said second frequency converter means being supplied to said first frequency converter means as the signal for frequency conversion.

4,415,937
SOLID-STATE IMAGE STORAGE DEVICE

Jun-ichi Nishizawa, Sendai, and Masahiro Konishi, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co. Ltd., Japan

Filed Dec. 2, 1981, Ser. No. 326,879
Claims priority, application Japan, Dec. 5, 1980, 55-171901
Int. Cl.³ G11B *5/00*; H04N *5/76*
U.S. Cl. 358—335 **8 Claims**



1. A solid-state image storage device comprising:

a photoelectric converter having a plurality of non-destructive readout image sensor cells arranged in one of a line and a matrix for receiving an image;

a scanner for scanning the photoelectric converter to read out image information of the plurality of image sensor cells; and

a recorder having a recording medium for recording the image information read out by the scanner from the plurality of image sensor cells;

wherein the scanner has means so that the operation of reading out the image information of all of the plurality of image sensor cells by the scanner is carried out a plurality of times to obtain a plurality of image informations on the same image formed on the photoelectric converter, and the plurality of image informations thus read out are respectively recorded at different positions on the recording medium of the recorder.

4,415,938
METHOD AND SYSTEM FOR ERROR CORRECTION IN DIGITAL VIDEO SIGNAL RECORDING

Jürgen Heitmann, Seeheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,786
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045226
Int. Cl.³ G11B *5/09, 27/36*
U.S. Cl. 360—53 **7 Claims**

1. Method of correcting digitally coded video signals which are erroneously recorded on a magnetic recording medium (9) and wherein the data are applied in the form of a stream of data words, in which the stream of words is subdivided into a group or train of words with gaps or intervals defined by retrace gaps of the video signals between said groups or trains of words,

wherein the data are recorded on magnetic tape by a rotating head wheel (1) carrying a recording transducer head (2) and a reading-out and reproduction transducer head (4), which is spatially offset ($\Delta\alpha$) with respect to the recording transducer head (2) which effects said recording of the data;

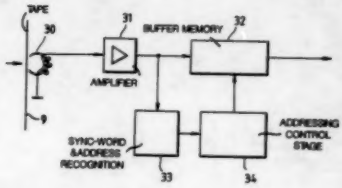
comprising the steps of

applying the data to a first channel including the recording transducer head and recording the data on the tape (9);

immediately after recording the data on the tape, reading-out said data from the tape independently of the recording of the data to obtain reproduced data by deriving data from the spatially offset reproduction transducer head (4);

applying the data to a second channel;

time-delaying the data in the second channel by the time



period of delay between recording and reading-out or reproducing said recorded data by a time period of delay (ΔT) which corresponds to the quotient of circumferential offset (Δa) of the reproducing head (4) and of the recording head (2) with respect to the circumferential speed of the head wheel (1);

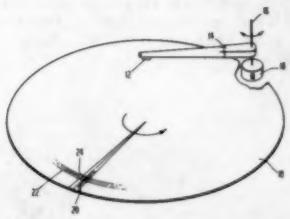
comparing the time-delayed signals in the second channel with the read-out reproduced data;

and, if the comparison indicates inconsistencies, storing the time-delayed data and re-recording said data on the tape during the gaps or intervals of succeeding groups or trains of words.

4,415,939
HEAD POSITIONING SERVO FOR DISK DRIVE

Douglas F. Ballard, South Ogden, Utah, assignor to Iomega Corporation, Ogden, Utah

Filed Apr. 27, 1981, Ser. No. 257,608
Int. Cl.³ G11B *21/02, 21/10*
U.S. Cl. 360—75 **2 Claims**



1. Apparatus for the control of the position of a read/write head with respect to a magnetic recording disk, said disk having recorded thereon at regular intervals first and second position signals of identical polarity, said apparatus comprising:

servo motor means for moving said head with respect to said disk;

a first summing means for adding successive ones of said first and second position signals, and for controlling variable amplification of said signals in accordance with the value of said sum; and

comparator means for comparing the values of successive ones of said first and second signals and for generating a servo signal applied to said motor as a result of said com-

parison, such that said first and second signals tend to be equalized.

4,415,940

DEVICE FOR INSERTING AND EJECTING A DISKETTE CARTRIDGE INTO OR FROM A DRIVE MECHANISM

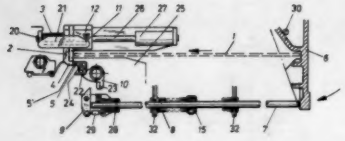
Gerhard Becker, Neunkirchen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1981, Ser. No. 262,256

Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3017970

Int. Cl.³ G11B 5/16, 5/48

U.S. Cl. 360—99 8 Claims



1. A diskette drive mechanism comprising a closure pivotally mounted on a housing, for closing a receiving slot for a cartridge accommodating a magnetic diskette, a magnetic head liftable off and engageable with a received diskette, a movable head lever on which the head is arranged, the lever extending radially relative to the axis of rotation of the diskette, and an ejection slide which, by inserting the diskette cartridge, is movable along a first path into a latched position against a force of a first spring associated with the housing and, by opening the closure, is unlatched to eject the diskette cartridge, characterized in that the ejection slide is associated with a lever arm (21) having a longitudinal axis which corresponds to the direction of movement of the ejection slide (2), the arm extending parallel to the head lever (13) and, on each end, being provided with an inclined surface (11,20) which, during inserting or ejecting of the diskette cartridge (1), cooperates with a cross arm (12) arranged on the head lever (13) to lift or lower the magnetic head (14).

4,415,941

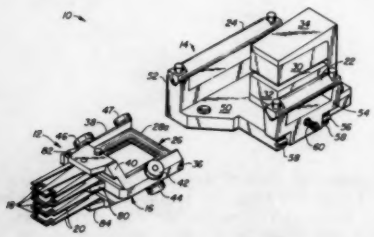
LINEAR ACTUATOR FOR MEMORY STORAGE DEVICE

Frank C. Gibeau, Los Altos, and Paul L. Farmer, San Martin, both of Calif., assignors to Atasi Corporation, San Jose, Calif.

Filed Jun. 29, 1981, Ser. No. 278,867

Int. Cl.³ G11B 5/55, 21/08, 5/012

U.S. Cl. 360—106 11 Claims



1. A linear actuator for moving a transducer back and forth along a linear path of travel relative to media such as a rotating disk media, the actuator comprising: first and second cylindrical guide members, means for mounting the guide members in spaced relationship parallel to the media, a carriage, means for mounting the transducer to one end of said carriage, an essentially rectangular flat coil member mounted to said carriage and including a flat effective winding section and a second winding section, each extending transversely of the direction of travel of the carriage, roller means mounted to said carriage in rolling engagement against the cylindrical guide members for guiding the carriage back and forth along the guide members, said roller means including pairs of displaced rollers at each side of the carriage for engagement against the associated guide member, said pairs of rollers and said coil member being mounted upon the carriage so that the flat effective winding section of said coil member is parallel to the direction of travel and is spaced between the rollers of each pair of rollers, and a pair of spaced permanent magnets fixedly mounted relative to the carriage and having a gap therebetween in alignment with the path of travel through said gap of the flat effective winding section of the coil member, said magnets being laterally outward from said media and said second transverse winding section being outside said gap during the travel of said carriage.

4,415,942

MAGNETIC DISK SUBSTRATE OF FIBER-REINFORCED PLASTIC

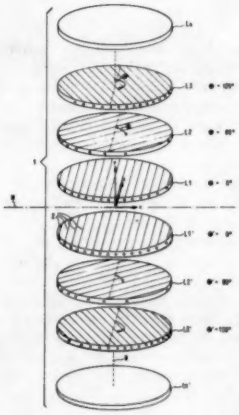
Albert Frosch, Herrenberg; Holger Hinkel, Boeblingen, and Georg Kraus, Wildberg, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,674

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 80105339

Int. Cl.³ G11B 5/62

U.S. Cl. 360—135 10 Claims



1. A magnetic disk substrate of plastic containing fibers, characterized in

that said substrate is pressed in the form of a laminate from a plurality of thin lamellae of fiber-reinforced plastic, said lamellae being arranged on top of each other at equal angular spacings, $\theta=\pi/n$, n, an integer, $\geqq 3$.

4,415,943

EQUIPMENT PROTECTOR AND ENERGY SAVING APPARATUS

Donald W. Wortman, Central Islip, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.

Filed Apr. 21, 1982, Ser. No. 370,337

Int. Cl.³ H02H 3/13, 7/09

U.S. Cl. 361—22 23 Claims

1. An equipment protector and energy saving apparatus comprising:

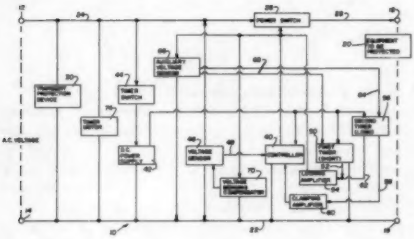
(a) a pair of input terminals and a pair of output terminals, said

pair of input terminals being adapted to be connected to an AC source of voltage, said pair of output terminals being adapted to be connected to an equipment load, said AC voltage source being provided with a continuous electrically conducting path from one of said pair of input terminals to one of said pair of output terminals;

(b) power switching means coupled from the other of said pair of input terminals to the other of said pair of output terminals, said power switching means being in a normally opened position interrupting the electrically conducting path from the other of said pair of input terminals to the other of said pair of output terminals;

(c) control means coupled to said power switching means for changing said normally open position of said power switching means to a closed position to complete said other electrically conducting path;

(d) voltage sensing means connected across said pair of input terminals for sensing the magnitude of the AC voltage connected thereto and providing a first signal voltage, said first signal voltage being coupled to said control means for causing said control means to change from a normally high impedance state to a low impedance state and causing said power switching means to change to a closed position when said AC voltage exceeds a predetermined magnitude, said control means providing a second signal voltage;



(e) first relatively short timing means coupled to said control means for receiving said second signal voltage, said first timing means providing a third signal voltage for a predetermined time after said control means provides said second signal voltage;

(f) locking means coupled in parallel with said control means for holding said power switching means in said closed position responsive to said third signal voltage until said first timing means times out;

(g) differentiation means for differentiating said third signal voltage;

(h) second relatively long timing means, coupled to said first timing means for receiving said differentiated third signal voltage, said second timing means providing a fourth signal voltage for a predetermined time after receiving said differentiated third signal voltage only if said input AC voltage is below said predetermined magnitude;

(i) clamping means coupled to said control means for clamping said control means in its relatively high impedance state responsive to said fourth signal voltage causing said power switching means to be in its normally open position; and

(j) DC power supply means coupled to said control means, said power switching means and said first and said second timer means for providing a DC operating voltage therefor from said AC voltage source.

4,415,944

ELECTRICAL APPARATUS

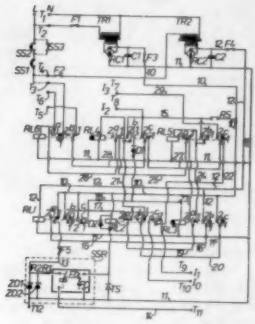
Robert A. Walker, Loughborough, England, assignor to The Boots Company PLC, England

Continuation of Ser. No. 917,411, Jun. 21, 1978, abandoned. This application Sep. 23, 1980, Ser. No. 189,910

Claims priority, application United Kingdom, Jun. 23, 1977, 26328/77

Int. Cl.³ H02H 3/16

U.S. Cl. 361—42 **7 Claims**



1. An earth proving circuit whereby the existence of a desired earth connection for electrically powered apparatus can be established and positively indicated prior to the supply of power level voltage and current from a power supply connectable to the electrically-powered apparatus, the circuit comprising a non-inductive solid state relay unit having no inductive reactance and capable of allowing passage of only a low current of the order of a few milliamperes therethrough at a low voltage of the order of 12 volts under conditions where an earth connection for the non-inductive solid state relay unit is established, circuit means for supplying a low current/low voltage electric signal to said non-inductive solid state relay unit and capable of operating said solid state relay unit in the presence of a good ground connection, indicator means for indicating the condition of the earth connection to the non-inductive solid state relay unit in response to energization by said low current/low voltage electric signal, ground connection means for connecting the earth connection of said non-inductive solid state relay unit to the ground connection for the electrically powered apparatus to be tested for the existence of a good ground connection in advance of the supply of power level voltage and current thereto, and fourth logic circuit means for locking-out operation of said electrically powered apparatus by preventing the supply of power level current and voltage thereto in the event of a ground or circuit fault during operation of the apparatus and continued operation of a manually operable start switch means, and manually operable reset switch means for resetting said fourth logic circuit means to allow supply of power level current and voltage to the apparatus operable only after correction of the fault and re-establishment and proof of the existence of a suitable ground connection for the electrically powered apparatus.

4,415,945

DETECTOR APPARATUS OF THE TWO-TERMINAL TYPE SUPPLIED WITH RECTIFIED A.C. POWER THE VOLTAGE OF WHICH CAN VARY IN A WIDE RANGE, WITH LOAD CONTROL BY SWITCHING THYRISTORS

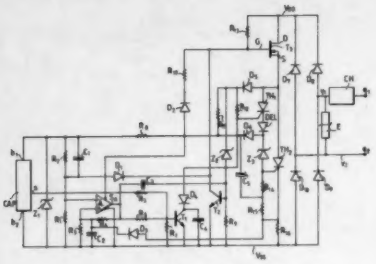
Jean-Marie Periot, Isle d'Espagnac, France, assignor to La Telemecanique Electrique, France

Filed Dec. 17, 1981, Ser. No. 331,718

Claims priority, application France, Dec. 31, 1980, 80 27871

Int. Cl.³ H02H 3/08

U.S. Cl. 361—100 **8 Claims**



1. A detector apparatus for controlling the flow of current through a load in dependence with information provided by a sensor, said detector apparatus comprising:

(i) signal generating means (CAP) for generating an output signal from the said information, said signal generating means having first (b_1) and second (b_2) power supply inputs and a signal output (s);

(ii) first and second power supply terminals (e_1e_2), the detector apparatus having first and second terminals, the first terminal of the apparatus being connected to the first power supply terminal (e_1) through the load and the second terminal of the apparatus being connected to the second power supply terminal (e_2);

(iii) rectifier means (D_7–D_{10}) having a pair of input terminals connected accross the first and second terminals of the apparatus and a pair of output terminals and first (V_{DD}) and second (V_{SS}) power supply lines connecting the respective output terminals of the rectifier means to the respective power supply inputs (b_1b_2) of the signal generating means;

(iv) a high gain solid state component (T_3) having a source (S), a drain (D) and a gate (G), said drain being connected to the first power supply line (V_{DD}) and said gate being connected to the first power supply (V_{DD}) of the rectifier means through a biasing resistor (R_{13});

(v) circuit means, including a first thyristor (TH_1) having a gate and a Zener diode (Z_3) connected in series and in opposition, said circuit means connecting the source (S) of the said high gain solid state component (T_3) to the second power supply line (V_{SS}), said Zener diode (Z_3) having an anode and a cathode;

(vi) a transistor (T_1) having an input electrode, and output electrode which is connected to the said second power supply line (V_{SS}) and a control electrode; and means (D_4) for connecting the gate of the said first thyristor (TH_1) to the said input electrode;

(vii) differential amplifier means (A) having first and second inputs and an output, the output of the said differential amplifier means being connected to the control electrode of the said transistor (T_1), a resistor bridge (R_1R_2) connecting the power supply inputs (b_1–b_2) of the signal generating means to the first input of the differential amplifier means, and first resistance means (R_3) connecting the second power supply line (V_{SS}) to the second input of the differential amplifier means;

(viii) a first capacitor (C_5); means (D_6) for connecting said capacitor to the cathode of the Zener diode (Z_3), means (R_{14}) for connecting said first capacitor to the anode of the Zener diode (Z_3), and means (R_8) connecting the capacitor to the first power supply input (b_1) of the signal generating means;

(ix) means ($R_{14}R_{15}R_{16}D_3$), connecting the anode of the Zener diode (Z_3) to the second input of the differential amplifier means,

whereby the said transistor (T_1) which is normally blocked whenever the signal generating means provide an output signal, becomes saturated upon occurrence of an overload or short through the load, and consequently, the said first thyristor (TH_1) is blocked.

4,415,946

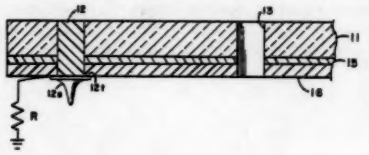
ANTISTATIC CHAIRMAT

Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Feb. 8, 1982, Ser. No. 346,716

Int. Cl.³ H05F 3/00

U.S. Cl. 361—212 **21 Claims**



1. A charge dissipating floormat comprising:

a dielectric panel comprised of a transparent polymeric material, containing a plurality of channels between upper and lower surfaces;

a semiconductive base layer at the lower surface of said dielectric panel containing a plurality of channels corresponding to the channels in said dielectric panel;

a plurality of inserts fitted within the channels in said dielectric panel and semiconductive base layer, said inserts being comprised of a material selected from the group electrically conductive and semiconductive materials; and

an electric ground for said inserts.

4,415,947

METHOD AND APPARATUS FOR ELECTROSTATICALLY CHARGING A DIELECTRIC LAYER

Kurt Dryczynski, Hofheim; Günther Schädlich, and Roland Moraw, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 92,276, Nov. 8, 1979, Pat. No. 4,353,970. This application Apr. 16, 1981, Ser. No. 254,981

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1978, 2849222

Int. Cl.³ H05F 3/00

U.S. Cl. 361—235 **29 Claims**

1. An apparatus for electrostatically charging a dielectric layer to a predetermined potential, said apparatus comprising:

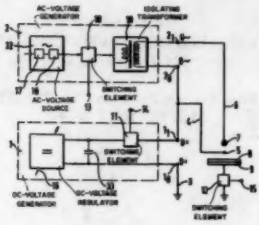
AC voltage generating means for providing an AC voltage U_{AC}, said means having a hot output terminal and a cold output terminal;

DC voltage generating means for providing a DC voltage U_{DC}, said means having a hot output terminal and a cold output terminal;

AC electrode means connected to the hot output terminal of said AC voltage generating means and located at a distance from said dielectric layer, said AC electrode means in combination with said AC voltage generating means providing

means for generating charge carriers at a distance from said dielectric layer;

DC electrode means connected to the hot output terminal of said DC voltage generating means and located in a path between said AC electrode means and said dielectric layer, said DC electrode means in combination with said DC voltage generating means providing means for directing said charge carriers to said dielectric layer; and



switching element means for modulating said DC voltage generating means, said switching element means including a connection means for inputting a voltage for modulating the DC voltage U_{DC}.

4,415,948

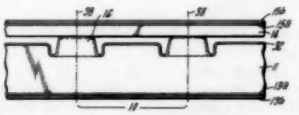
ELECTROSTATIC BONDED, SILICON CAPACITIVE PRESSURE TRANSDUCER

Daniel H. Grantham, Glastonbury, and James L. Swindal, East Hampton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1981, Ser. No. 310,597

Int. Cl.³ H01G 7/00

U.S. Cl. 361—283 **2 Claims**



1. A method of forming a capacitive pressure sensor by field-assisted bonding of two pieces of silicon separated by borosilicate glass, to provide a pressure tight chamber including two closely-spaced surfaces having operative portions forming the respective plates of a pressure-variable capacitor, in which the improvement comprises depositing a thin layer of borosilicate glass on substantially the entire operative portion of the surface of one of said plates prior to application of the electrostatic field, thereby to avoid arcing between the plates and the commensurate short circuiting of the electrostatic field during the bonding process.

4,415,949

AIR TRIMMER CAPACITOR

Martin J. Blickstein, Austell, Ga., assignor to Murata Corporation of America, Rockmart, Ga.

Filed Aug. 24, 1981, Ser. No. 295,716

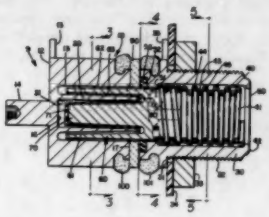
Int. Cl.³ H01G 5/14

U.S. Cl. 361—296 **7 Claims**

1. In a variable coaxial air trimmer capacitor including at least one stationary electrode and at least one movable electrode adapted to be moved with respect to said stationary electrode so as to vary the capacitance, dielectric means for separating said movable electrode from said stationary electrode, a housing containing said stationary electrode at one end and said movable electrode at the opposite end, the improvement comprising:

a rotor mounted for rotation about an axis within said housing and including said movable electrode affixed at one end;

means defining a thread upon at least a portion of the outer surface of said rotor; and



coil multi-turn resilient spring means confined within said housing for engaging said thread as said rotor rotates about said axis.

4,415,950

CAPACITORS

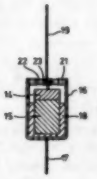
Ronald D. Weeks, Brixham, and David J. Croney, Paignton, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,524

Claims priority, application United Kingdom, Jul. 3, 1979, 7923112

Int. Cl.³ H01G 9/00

U.S. Cl. 361—433 **2 Claims**



1. An electrical component comprising, in contact and electrical connection with one another, a tin-containing solder alloy body and a conductive coating layer having both silver particles and copper particles interspersed therein and formed by a paint containing, by weight, 10 to 40% of the silver particles, 50 to 10% of the copper particles, 2 to 12% of a polymeric binder, 30 to 60% of a solvent, and 0.01 to 1% of a wetting agent.

4,415,951

LAMPCHANGER

Marion L. Recane, Houston; William V. Burns, Austin; Charles E. McMillen, and Dan G. Luce, both of Houston, all of Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Jun. 16, 1982, Ser. No. 388,843

Int. Cl.³ F21V 19/04

U.S. Cl. 362—20 **3 Claims**

1. A lampchanger for use in a signal lantern having a focusing lens comprising,

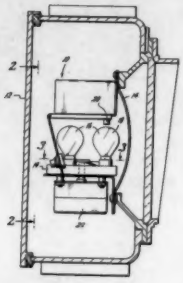
a horizontally rotatable turret adapted to support a plurality of lamps for indexing one of the lamps to the focal point of the lens,

said turret including a plurality of bayonet sockets for holding a lamp, said sockets having resilient sides which taper inwardly away from the turret body for accurately securing the lamp in position,

said turret including a contact insulator having a radially extending slot adjacent each of the sockets,

a power contact positioned in each of the slots, said power contact adapted to engage the bottom of a lamp positioned in a socket for making good contact with the lamp,

a power brush engaging the insulator and positioned to engage the power contact of the lamp positioned in the focal point of the lens and engaging the slot of the power contact of the positioned lamp for mechanically holding a



turret in position with a lamp in the focal point of the lens, and

a light detector means directed at the lamp in position in the focal point of the lens for detecting whether the lamp is lighted,

motor means connected to the turret for rotating the turret, and

a control circuit connected to the light detector and to the motor means for actuating the motor means when the light detector detects a burned out lamp.

4,415,952

LIGHT SOURCE UNIT FOR AN OPTICAL APPARATUS

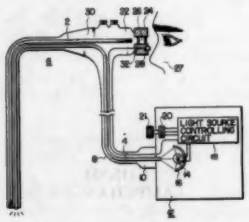
Shinichiro Hattori, Tokyo, and Yasuo Inoue, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,519

Claims priority, application Japan, Jun. 30, 1980, 55-88635

Int. Cl.³ F21V 7/04

U.S. Cl. 362—32 **14 Claims**



1. A light source unit for an optical apparatus having an eyepiece section comprising:

a light source for transmitting illuminating light for illuminating an area to be observed;

a power source for supplying electrical power to said light source;

sensing means for sensing the presence of an operator at said optical apparatus for observing said area and for emitting an output signal indicating said presence or absence of an operator at said optical apparatus;

a judging circuit coupled to said sensing means and responsive to said output signal from said sensing means indicating that the operator is absent from said optical apparatus, for producing a light emitting signal for limiting said illuminating light; and

limiting means coupled to said judging circuit and being responsive to said light limiting signal for limiting the illuminating light transmitted from said light source to said area as a function of said light limiting signal.

4,415,953

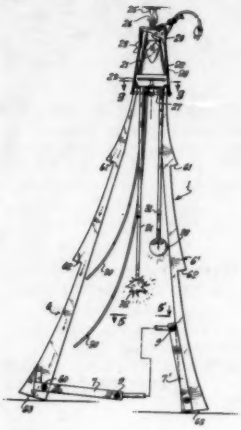
TREE-LIKE DECORATIVE DEVICE

William C. Shepherd, 725 Palomares Ave., San Dimas, Calif. 91773

Filed Jul. 13, 1981, Ser. No. 282,397

Int. Cl.³ F21V 7/04

U.S. Cl. 362—32 **26 Claims**



1. A tree-simulating illuminated decorative device which comprises:

an upper frame member,

a plurality of light-conducting elements each having a first axial extremity connected with said upper frame member,

lamp means mounted proximate to said upper frame member for illuminating said first axial extremities of said elements,

certain of said light-conducting elements defining notches in at least one edge thereof to glow with light conducted by the elements, and

means pivotally connected to lower end portions of the elements for retraction of the elements to provide a folded configuration of the decorative device.

4,415,954

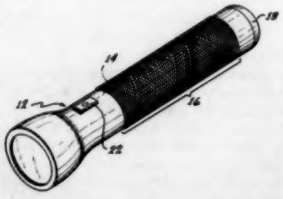
GRIP SHIELD

Roger W. Schaefer, San Luis Obispo, Calif., assignor to Centurion Safety Products, Inc., San Luis Obispo, Calif.

Filed Apr. 23, 1982, Ser. No. 370,932

Int. Cl.³ F21L 7/00

U.S. Cl. 362—202 **3 Claims**



1. A flashlight having an improved hand grip, comprising:

a barrel portion of the flashlight having an elongated cylindrical shape;

a sleeve of a resilient non-abrasive slip-resistant material, having an inside diameter in its relaxed state less than the outside diameter of said barrel portion, said sleeve extending over the surface of said barrel portion and squeezing said barrel by virtue of said sleeve being stretched from its relaxed state to fit over said barrel portion, said sleeve being open at both of its ends so as not to enclose either end of the flashlight; and,

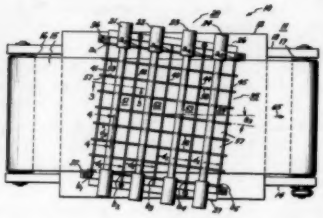
a coating of dried lubricant between said sleeve and said barrel portion bonding said sleeve to said barrel portion so that said sleeve can not be non-destructively removed from said barrel portion.

4,415,955

IRRADIATION APPARATUS UTILIZING LINEAR RADIATION SOURCES

Bruce F. Griffing; Peter D. Johnson, both of Schenectady, and Roger N. Johnson, Hagaman, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,137
Int. Cl.³ F21S *3/00*
U.S. Cl. 362—225 **14 Claims**



1. In combination,

means for providing a planar surface,

means for irradiating an area of said surface, said area being of generally quadrangular outline and being bounded by a pair of generally parallel long sides and a pair of generally parallel short sides, said irradiation means comprising:

a source of radiation of generally cylindrical outline having a length large in relation to the diameter thereof, the central axis of said source of radiation being located at first predetermined distance above said area and spaced parallel to the long sides thereof,

a pair of radiation first absorbent surfaces, each having a lower edge adjacent a respective long side of said area along the length thereof and each having an upper edge adjacent said source of radiation, the lower edges of said pair of first radiation absorbent surfaces spaced apart by a second predetermined distance,

a plurality of pairs of second radiation absorbent surfaces, each second radiation absorbent surface being orthogonal to said planar surface and located between said pair of first radiation absorbent surfaces,

each of said second radiation absorbent surfaces having a lower edge adjacent said area and an upper edge adjacent said source of radiation, the lower edges of said pair of second radiation absorbent surfaces spaced apart by a third predetermined distance,

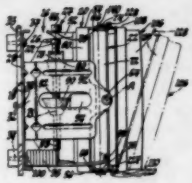
each pair of second radiation absorbent surfaces forming with portions of the surfaces of the first pair of radiation absorbent surfaces included therebetween a respective cell, each cell overlying a respective portion of said area, each cell subtending a respective segment of said source of radiation.

4,415,956

RETAINER MEMBER FOR A VEHICLE HEADLAMP

David R. McMahan, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,659
Int. Cl.³ F21V *21/26*
U.S. Cl. 362—269 **3 Claims**



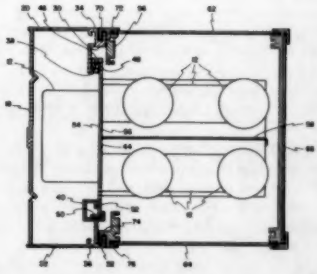
1. A retainer member for maintaining a headlamp within a support housing formed with locator surfaces, said retainer member including a frame adapted to surround the front peripheral portion of said headlamp, cooperating hook and slot means formed on one portion of said frame and on said support housing for removably connecting said one portion of said frame to said support housing for pivotal movement about an axis substantially perpendicular to the optical axis of said headlamp, cooperating flange and manually operable spring clip means carried by another portion of said frame and by said support housing for locking said retainer member to said support housing when said hook and slot means are interconnected, said frame being formed with a radially inwardly extending rim which is inclined towards the rear of said support housing so when said retainer member is locked to said support housing by said cooperating flange and spring clip means said rim engages the lens of said headlamp and serves as a spring to bias said headlamp inwardly towards said locator surfaces.

4,415,957

PATIENT LIGHT WITH HANGER AND HINGE ARRANGEMENT FOR REMOVAL WITHOUT TOOLS

Wesley W. Schwartz, Oshkosh, Wis., assignor to Square D Company, Palatine, Ill.

Filed Feb. 13, 1981, Ser. No. 234,075
Int. Cl.³ F21V *21/08*
U.S. Cl. 362—297 **16 Claims**



1. A light fixture having electrical lighting components comprising:

a base with electrical components for attachment to a source of electrical power, said base having top and bottom outer attachment means and top and bottom inner attachment means;

where said top and bottom inner attachment means comprise a top support hanger and a bottom support hinge;

a support section for supporting the electrical lighting compo-

nents having top and bottom attachment means for interlocking with said top and bottom inner attachment means of said base;

a cover with light emitting portions having top and bottom attachment means for interlocking with said top and bottom outer attachment means of said base;

means for electrically connecting said electrical components of said base to said electrical lighting components of said support section; and,

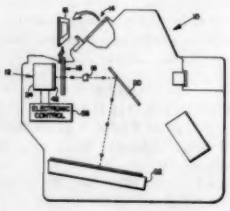
wherein said support section and said cover can be assembled and disassembled from said base without the use of any tools and also wherein said support section can be held in place on said base in two different positions, said bottom inner attachment means on said base and said bottom attachment means on said support section being capable of interlocking in two different positions.

4,415,958

DEVICE FOR ILLUMINATING TRANSPARENCIES

John M. Guerra, Brighton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 21, 1981, Ser. No. 266,082
Int. Cl.³ F21V 7/00
U.S. Cl. 362—301 **5 Claims**



1. A lighting device for illuminating transparencies, said lighting device comprising:

an open-ended, rectangular parallelepiped-shaped housing having a base opposite said open-end thereof and four sides extending uprightly from said base, all of the interior surfaces thereof being specularly reflective;

a partially reflecting/diffusing opal glass screen located in parallel overlying relationship to said housing open-end; and

an elongated source of artificial illumination mounted in said housing so that its longitudinal axis is parallel to the plane containing said housing open-end and either two opposing ones of said upright sides and spaced away from said housing base by a distance which is closer to said housing base than to said housing open-end;

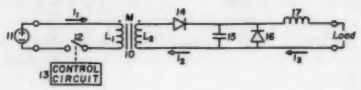
said lighting device being structured so that said specularly reflective interior surfaces of said housing in combination with said partially reflecting/diffusing opal glass screen interior surface cause multiple internal reflections of said artificial light source within said housing whereby a plurality of images of said artificial light source are formed on the interior surface of said opal glass screen and are diffused by said opal glass screen to provide a substantially uniform illumination across the exterior surface of said opal glass screen.

4,415,959

FORWARD CONVERTER SWITCHING AT ZERO CURRENT

Patrizio Vinciarelli, Skillman, N.J., assignor to Vicor Corporation, Westford, Mass.

Filed Mar. 20, 1981, Ser. No. 246,120
Int. Cl.³ H02P 13/22
U.S. Cl. 363—21 **13 Claims**



1. A single-ended, zero current switching forward converter circuit comprising:

a voltage source;

a power transformer including a primary winding and a secondary winding, said power transformer being constructed to have an effective secondary leakage inductance $L_{2\ell}$;

a switching device to selectively couple said voltage source across the primary winding of said power transformer;

a first unidirectional conducting device connected in series with said secondary winding and oriented to conduct during conduction by said switching device;

a capacitor of capacitance C connected in series with said secondary winding and said unidirectional conducting device;

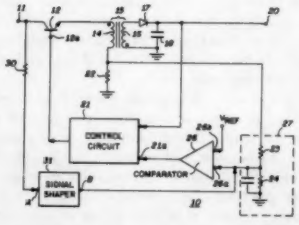
control means for selectively closing and opening said switching device to transfer energy from said voltage source via the effective leakage inductance of said transformer to charge said capacitance during an energy transfer cycle having a characteristic time scale of $\pi\sqrt{L_{2\ell}C}$.

4,415,960

LINE VARIABLE OVERCURRENT PROTECTION FOR A VOLTAGE CONVERSION CIRCUIT

Charles A. Clark, Jr., Chatsworth, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,941
Int. Cl.³ H02M 3/335
U.S. Cl. 363—21 **3 Claims**



1. An improved voltage converter of the type responsive to an input d.c. voltage on an input line for providing an output voltage to a load, said converter including a transformer having a primary and a secondary winding, sensor means comprising a resistor coupled in series with said primary winding for providing a voltage analog of current in said primary winding, switching means coupled in series with said primary winding, control circuit means coupled to said sensor means for opening said switching means in response to signals received from said primary winding, and low pass filter means coupled betweem said control circuit means and said sensor means, wherein the improvement comprises:

means, comprising a resistor coupled to said primary wind-

ing, coupled to said input line for sampling said input d.c. voltage; and

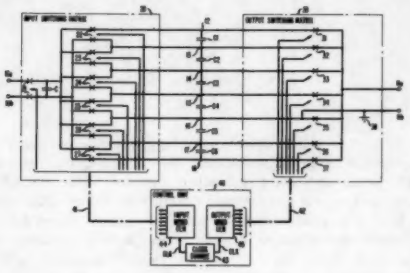
means, coupled to said input d.c. voltage sampling means, for augmenting said voltage analog with said input d.c. voltage sample, said augmenting means including means, comprising a passive non-linear signal shaping network, for shaping said input d.c. voltage.

4,415,961

TELEPHONE RINGING SIGNAL GENERATOR

William R. Harmon, Jr., Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 26, 1981, Ser. No. 296,307
Int. Cl.³ H03K *3/51*
U.S. Cl. 363—43 **6 Claims**



1. A waveform generator (FIG. 1) for converting a supplied direct current signal (10*a*, 10*b*) into an alternating current signal (11*a*, 11*b*), the generator being characterized by,

means (40) for generating first (41) and second (42) control signals,

a plurality of means (C1 through C6), each having at least two terminals (12 through 18) connected in a fixed circuit configuration for storing an amplitude representation of a signal applied thereto,

means (20) responsive to the first control signal for selectively steering the supplied direct control signal to the plurality of storage means,

means responsive to the first control signal for controllably isolating said steering means from the supplied direct current signal, and

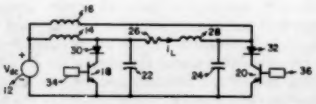
selection means (30) responsive to the second control signal for transferring a stored amplitude representation from selected terminals to generate the alternating current signal.

4,415,962

CURRENT MODE SINE WAVE INVERTER

John G. Kassakian, Newton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 15, 1981, Ser. No. 274,006
Int. Cl.³ H02M *7/537*
U.S. Cl. 363—131 **9 Claims**



1. An inverter comprising:

(a) first and second means each producing a substantially constant dc current;

(b) first and second switching means connected in parallel with the first and second dc current producing means, respectively;

(c) first and second capacitance means connected in parallel with the first and second switching means, respectively;

(d) load means connected to said first and second current producing means;

(e) inductance means coupled to said load means; and

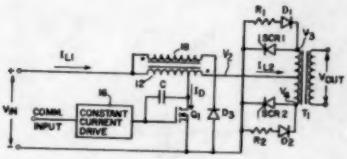
(f) means for controlling the operation of said first and second switching means so that said switching means operate sequentially, whereby current through the load means executes a sinusoidal cycle when the first switching means is opened and a complementary sinusoidal cycle when the second switching means is opened.

4,415,963

FET COMMUTATED CURRENT-FED INVERTER

Wally E. Rippel, Altadena, and Dean B. Edwards, Monrovia, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 24, 1981, Ser. No. 257,478
Int. Cl.³ H02M *7/515*
U.S. Cl. 363—135 **8 Claims**



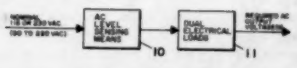
1. In a current-fed inverter an improvement comprised of a tapped inductor for connecting a dc source of power to said inverter and a field-effect transistor having source, drain and gate electrodes connected with its source and drain electrodes to bypass output current from said inductor to said dc source while a switch in said inverter is being turned off and another switch is being turned on, wherein said inverter switches are thyristors and said field-effect transistor is connected to said tap in said inductor, thereby providing an autotransformer for back biasing said thyristors while said field-effect transistor is commutating said thyristors, and wherein an external capacitor is connected between said drain and gate electrodes of said field-effect transistor, and where turn on and turn off drive to said field-effect transistor is provided by a gated constant current source connected to said gate electrode.

4,415,964

POWER SUPPLY

James A. Scharfe, Jr., 344 Camino Del Cielo, South Pasadena, Calif. 91030

Filed Dec. 28, 1981, Ser. No. 335,059
Int. Cl.³ H02M *1/10*
U.S. Cl. 363—142 **30 Claims**



1. A method for automatically producing an output voltage which is within a first range of voltages from an input voltage which is within the first range of voltages or within a second range of voltages comprising: automatically sensing the input voltage to determine if its magnitude is within said first or second range of voltages; automatically connecting a plurality of electrical loads in parallel with the input voltage whenever the sensed input voltage has a magnitude within said first range of voltages; or automatically connecting said plurality of electrical loads in series with said input voltage whenever the

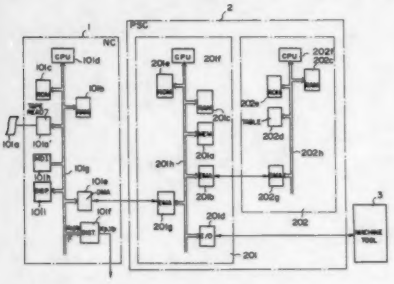
sensed input voltage is within said second range of voltages, said plurality of loads producing an output voltage.

4,415,965

PROGRAMMABLE SEQUENCE CONTROLLER

Ryoji Imazeki, Hachioji; Katsuaki Kusumi, Kawasaki, and Yoshihiro Nakajima, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jan. 12, 1981, Ser. No. 224,025
Claims priority, application Japan, Feb. 1, 1980, 55-11108
Int. Cl.³ G06F *15/46*; G05B *19/18*
U.S. Cl. 364—136 **4 Claims**



1. A programmable sequence controller, operatively connected to a numerical control device which is for generating commands, said numerical control device including display means for displaying input and output signals and manual data input means for inputting numerical values, and said programmable sequence controller operatively connected to a machine which generates input signals, such as a machine tool or robot, wherein said programmable sequence controller comprises a data input/output unit operatively connected to the machine and the numerical control device, and said programmable sequence controller for executing sequence process steps in dependence upon a predetermined internal sequence program and for generating and transmitting the output signals, in dependence upon the commands from the numerical control device, to the machine through said data input/output unit, said data input/output unit including:

flip-flops, operatively connected between the machine and the numerical control device, for storing the input and output signals;

counters, operatively connected between the machine and the numerical control device, for storing the input and output signals; and

registers, operatively connected between the machine and the numerical control device, for storing the input and output signals;

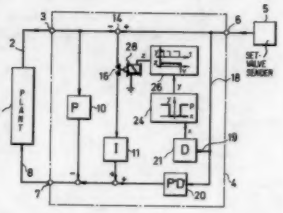
wherein the contents of the flip-flops, counters, and registers in said data input/output unit, which are for temporarily storing the input and output signals sent to and received from the machine, are displayed on the display means in the numerical control device, and wherein predetermined numerical values are set in said counters and registers by the manual data input means in the numerical control device.

4,415,966

CONTROL CIRCUIT FOR A CONTROLLER AND A METHOD OF OPERATING THE SAME

Rudolf Herzog, Tobel, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 10, 1981, Ser. No. 242,225
Claims priority, application Switzerland, Mar. 19, 1980, 2156/80
Int. Cl.³ G05B *11/42*
U.S. Cl. 364—162 **6 Claims**



6. A method for controlling a sluggishly reacting plant by a controller having an output for delivering a control signal, a subtraction station for subtracting an actual value signal from a set value signal and emitting a control deviation signal corresponding to a difference between said signals, and an integral element connected to the subtraction station to receive said deviation signal and to emit a corresponding output signal to the output; said method comprising the steps of

sensing an abrupt change in said set value signal being delivered to the subtraction station; and

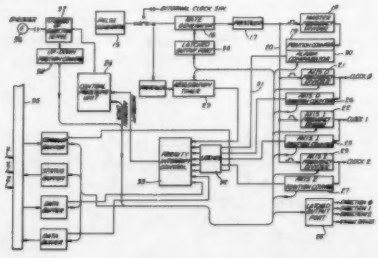
blocking transmission of a deviation signal from the subtraction station to the integral element in response to said abrupt change in said set value signal at least for the duration of said change in said set value signal.

4,415,967

MULTI-AXIS CONTROLLER

Robinson C. Russell, Northridge, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Jun. 2, 1981, Ser. No. 269,626
Int. Cl.³ G06F *15/46*; G05B *19/28*
U.S. Cl. 364—168 **6 Claims**



1. A system for moving a mechanical element along a vector path from a first position to a second position, said positions being defined by coordinates on at least two axes, comprising:

selectively actuatable means for storing the coordinates of said first and second positions and for producing electric signals representative of the differences of the two coordinaates on each axis;

first means responsive to pulse energization for moving the mechanical element parallel to that axis along which there is a greater coordinate change on moving from the first position to the second position;

second means responsive to pulse energization for moving the mechanical element along a path parallel to the other axis;

a source of pulses of a first frequency interconnected with the first moving means;

a second source of pulses having a frequency equal to that of the first frequency multiplied by the ratio of the shorter coordinate change to the longer coordinate change;

first and second counters interconnected with the respective first and second pulse sources for accumulating pulse counts corresponding to the change along the two axes on moving from the first to the second position;

means for storing temporarily intermediate pulse counts of said first counter;

means for multiplying the temporarily stored pulse count in the first counter by the ratio of the shorter axis coordinate change in moving from the first to the second positions to the longer axis coordinate change;

means for comparing the ratioed value of the temporarily stored pulse count with the intermediate stored pulse count in said second counter and forming an error signal; and

means responsive to the error signal for modifying the second source pulse frequency in such direction as to make the error signal zero to terminate accumulation of the counters on coincidence of the respective stored coordinates and the accumulated coordinates in the counters.

4,415,968

DIGITAL DATA PROCESSING SYSTEM WITH ASYNCHRONOUS SENSING UNITS

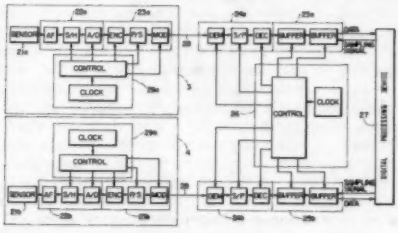
Koji Maeda, and Tadahiro Goda, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1981, Ser. No. 247,457

Claims priority, application Japan, Mar. 31, 1980, 55-42647

Int. Cl.³ G06F *15/46;* **G05B** *21/02*

U.S. Cl. 364—178 **3 Claims**



1. A digital data processing system for protecting an analog system such as an electric power system, comprising :

a plurality of sensing units, located remotely from one another, for sensing variable parameters representative of operating conditions of said system, each of said sensing units comprising (1) means for sampling at least one of said parameters at a predetermined time interval and means for converting samples of said at least one parameter into digital data, said converting means comprising analog-to-digital converter means having a sampling frequency higher than expected variations with time of said at least one parameter; and (2) transmitting means for transmitting said digital data, said analog-to-digital converter means of each of said sensing units operating asynchronously from one another; and

a data processing unit receiving digital data transmitted from each of said sensing units for producing control outputs for protectively controlling said analog system, said data processing unit comprising a data processing device for synchronously sampling said digital data transmitted from said sensing units and means for processing the sampled digital data in accordance with predetermined programs for producing said control outputs.

4,415,969

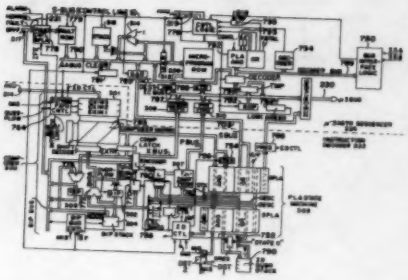
MACROINSTRUCTION TRANSLATOR UNIT FOR USE IN A MICROPROCESSOR

John A. Bayliss, Portland; Stephen R. Colley, Aloha; Roy H. Kravitz; William S. Richardson, both of Beaverton; Dorn K. Wilde, Aloha, all of Oreg., and Gurdev Singh, Los Gatos, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 7, 1980, Ser. No. 119,433

Int. Cl.³ G06F *9/00, 9/22, 9/30*

U.S. Cl. 364—200 **13 Claims**



1. For use in a data processing system including a main memory, a microprocessor instruction unit comprising:

an instruction decoder including means for receiving a macroinstruction from said main memory, means connected to said receiving means for interpreting said macroinstruction, said receiving means including first means for generating starting addresses for microinstruction routines, said microinstruction routines comprised of a plurality of microinstructions, and second means for generating single microinstructions, one microinstruction at a time;

a microinstruction sequencer to said instruction decoder; and,

an output bus connected to said a microinstruction sequencer;

said microinstruction sequencer including microprogram storage means for storing said microinstruction routines and means connected to said storing means for sequencing through the microinstructions comprising particular ones of said microinstruction routines necessary to execute a macroinstruction received by said instruction decoder, said microinstruction sequencer including third means connected to said first means for receiving said starting addresses generated by said first means, said starting addresses being for said microinstruction routines stored in said storing means, fourth means connected to said second means for receiving said single microinstructions generated by said second means, and fifth means connected to said microprogram storage means and to said fourth means for placing said microinstructions comprising said particular ones of said microinstruction routines and said single microinstructions on said output bus.

4,415,970

CACHE/DISK SUBSYSTEM WITH LOAD EQUALIZATION

Robert E. Swenson, Mendota Heights, Minn.; Lawrence D. Sasscer, Campbell, and Benjamin T. George, Sunnyvale, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 208,891

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **6 Claims**

1. A cache/disk system for interfacing a plurality of host

processors with a plurality of disk drive devices, said host processors generating commands and addressing information, including a disk drive device number and a relative word address, said system including:

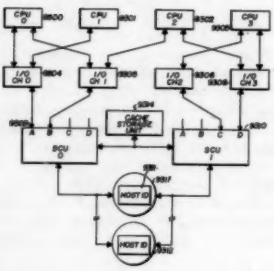
at least two storage control units each said storage control unit being connected to said host processors and said disk drive devices;

a cache memory unit connected to said storage control units, said cache memory unit including cache storage means, segment descriptor storage means and random access storage means for storing a command queue header and a plurality of command queues, all accessible to each of said storage control units;

there being a command queue for each of said disk drive devices with each command queue having a plurality of entries each representing a command waiting to be executed by its associated disk drive device;

each said storage control unit including,

means responsive to certain commands from said host processors for generating and loading an entry into the command queue associated with the disk drive device designated by said device number;



means operative during idle periods of the storage control unit for detecting command queues requiring servicing and seek complete signals from disk drives which are ready for data transfers;

first means responsive to said detecting means for servicing a command queue requiring service and issuing a seek signal to the associated disk drive device; and

second means responsive to said detecting means for formulating device end status and transmitting it to the host processor which issued the command;

said host processors including means for reissuing a command upon receipt of said device end status to the storage control unit which transmitted said status; and,

means in each said storage control unit for accepting a reissued command if it transmitted the device end status to the host processor reissuing it; and,

means in each said storage control unit, responsive to an accepted reissued command, for controlling the transfer of data from the disk drive device to the host processor reissuing the command,

whereby any storage control unit may process a seek complete signal even though it did not issue the seek signal.

4,415,971

APPARATUS FOR MANAGING THE DATA TRANSFERS BETWEEN A MEMORY UNIT AND THE DIFFERENT PROCESSING UNITS OF A DIGITAL DATA PROCESSING SYSTEM

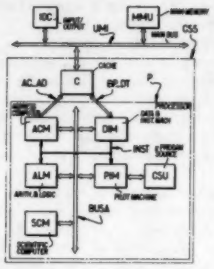
Michel J. Guillemet, Palaiseau, and Michel Isert, Paris, both of France, assignors to CII Honeywell Bull, Paris, France

Filed Mar. 31, 1981, Ser. No. 249,409

Claims priority, application France, Apr. 1, 1980, 80 07288

Int. Cl.³ G06F *13/00, 15/16*

U.S. Cl. 364—200 **4 Claims**



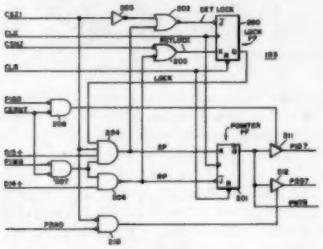
1. Apparatus for managing data transfers between a memory array and different processing units of a digital data processing system while a task of the system is being implemented, the memory array beiing included in at least one of the processing units, the memory array including a cache memory, and a main memory unit, the at least one processing unit further including an input-output unit, a sub-system and computer means; the memory array, input-output unit and sub-system being connected to the other processing units by a main bus, the at least one processing unit including a source of microinstructions, the at least one processing unit including internal bus means interconnecting the microinstruction source, the computer means, the memory array and the sub-system, the apparatus comprising an interface unit in the sub-system, the interface unit being connected with the memory array and the main bus so signals are transferred between the interface unit and the processing units via the main bus, the interface unit including a write buffer, a read buffer and a program buffer; the microinstruction source including: (a) a pointer BP for identification of the next byte to be exchanged between the main bus and the interface unit, (b) a pointer MP for identification of the next byte to be exchanged between the memory array and the interface unit; and (c) a pointer AMP for identification of the first word of the next transfer request to be exchanged between the memory array and the interface unit, a first memory counter AMC for storing an indication of the number of bytes remaining to be transferred between the memory array and the interface unit when a currently executed transfer request is completed, a second memory counter BC for storing an indication of the number of bytes remaining to be transferred between the interface unit and the processing units of the system via the main bus, and means responsive to the microinstruction source for interconnecting the main bus, the internal bus, the memory array, the first and second memory counters and the program, read and write buffers for: loading the read buffer with information items relating to data transmitted from the memory array to the processing units via the main bus, loading the write buffer with information items relating to data transmitted from the processing units to the memory array via the main bus, controlling the program, read and write buffers in response to the count in the first counter and the pointers, and controlling the read and write buffers in response to the same count in the second counter, the buffers being controlled so that there are: automatic transfers of information items relating to first instructions between the memory array and the inter-

face unit prior to the first instructions being performed, automatic transfers of first data from the memory array to the interface unit prior to the first data being used by the processing units, and automatic transfers of data from the processing units to the memory array, the automatic transfers being independent of microprograms performed in response to the microinstructions.

4,415,972
DUAL PORT MEMORY INTERLOCK

Ralph L. Adcock, Irvine, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,300
Int. Cl.³ G06F *15/16, 13/00*
U.S. Cl. 364—200 **5 Claims**

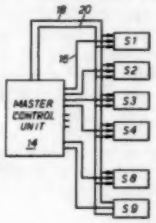


1. A computing system comprising
first (P1) processor means,
second (P2) processor means,
switching means (101),
first bus means (DB1) connected to selectively transfer signals between said first processor means and said switching means,
second bus means (DB2) connected to selectively transfer signals between said second processor means and said switching means,
memory means (100) connected to receive signals from said switching means, and
interlock means (103) connected to said switching means to determine which one of said first and second processor means is to be connected to said memory means via said switching means and assuring that only one processor means is so connected at any time,
said interlock means operative to normally maintain a priority status for said second processor means but selectively permitting either of said signal processor means to be connected to said switching means for consecutive operations thereof at the direction of said first and second processor means,
said interlock means produces a signal (P2D7) wherein said second processor means has said priority status and is normally connected to said memory means via said switching means in response to a control signal (CSZ1) from said second processor means and wherein said first processor means is connected to said memory means via said switching means only when said second processor is not so connected,
said interlock means includes first and second bistable means,
said first bistable means (200) connected to receive signals from said second processor means to produce signals representative of the status of said second processor means and to selectively prevent said first processor means from being connected to said switching means,
said second bistable means (201) connected to receive signals from said first and second processor means and to supply signals (PNTR) to said switching means to control which of said first and second processor means is connected to said memory means as well as to supply signals (P1D7, P2D7) to said first and second processor means to indicate whether the connection of the respective processor means has been permitted,
said second bistable means further connected to receive signals from said first bistable means to thereby produce signals which selectively preclude one of said first and second processor means from being connected to said memory means via said switching means,
said second bistable means connected to receive an inquiry signal from said first processor means when said first processor means attempts to be connected to said memory means via said switching means and to produce an output signal in response to said inquiry signal which output signal informs said first processor means if it has obtained control.

4,415,973
ARRAY PROCESSOR WITH STAND-BY FOR REPLACING FAILED SECTION

Colin Evans, Stevenage, England, assignor to International Computers Limited, London, England

Filed Mar. 16, 1981, Ser. No. 243,999
Claims priority, application United Kingdom, Mar. 28, 1980, 8010575
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **3 Claims**



1. An array processor having a plurality of sections of processing elements, and means for allocating a unique address to each section in a continuous sequence, comprising:
(a) at least three sections, each section comprising a plurality of processing elements connected together in a predetermined pattern,
(b) connection means coupled to said sections, for connecting said sections together in series,
(c) by-pass means coupled to said sections and operable to by-pass any selected one of said sections by directly interconnecting the sections on opposite sides of said selected section, thereby isolating said selected section from the other said sections, said by-pass means being operable only upon selection of said selected section, and
(d) means for variably allocating a continuous sequence of addresses to respective ones of said sections other than said selected one of said sections, at least some of said addresses being reallocated in said continuous sequence upon selection of said selected one of said sections whereby the sequence of said unique addresses in said continuous sequence is not altered upon the bypass of said selected section.

4,415,974
AIRSPEED DISPLAY SCALE WITH INTEGRAL TREND INDICATION

Owen B. Laug, Barnesville; Charles C. Gordon, Bethesda, and Robert O. Stone, Gaithersburg, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 11, 1981, Ser. No. 272,624
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—426 **6 Claims**

1. A linear digitally activated airspeed/trend indicator for indicating and displaying the airspeed of a landing aircraft and for indicating the airspeed trend as either increasing or decreasing in response to a linear analog voltage representative of the airspeed, which comprises:

a linear scale for indicating the airspeed and the airspeed trend in a predetermined airspeed range of 80 to 179 knots and including a corresponding mark for each airspeed knot within the range;

a plurality of juxtaposed display cubicles in alignment and cooperation with said linear scale for indicating and displaying the airspeed and airspeed trend as increasing or decreasing in the predetermined airspeed range, said plurality of juxtaposed display cubicles having frosted front surfaces for diffusing light and distributing it evenly so as to eliminate point sources of light;

a plurality of lamp pairs, each pair being connected in parallel, and each pair being disposed in one of said plurality of juxtaposed display cubicles; and

digital/electronic circuitry for lighting the appropriate one of said plurality of lamp pairs to indicate and display in response to the linear analog voltage representative of a corresponding particular airspeed in the predetermined airspeed range, and for lighting at a lower intensity, an adjacent one of said plurality of lamp pairs to the left or right of the appropriate one of said plurality of lamp pairs to indicate and display the trend of the particular airspeed as increasing or decreasing, respectively.

4,415,975
APPARATUS AND METHOD FOR ROUGH POSITIONING A VEHICLE AT A STORAGE BIN IN AN AUTOMATIC STORAGE AND RETRIEVAL SYSTEM

Harold S. Burt, Kansas City, Kans., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Dec. 31, 1980, Ser. No. 221,791
Int. Cl.³ G06F *15/50*; G05B *11/18*
U.S. Cl. 364—444 **19 Claims**

1. A rough positioning method whereby a vehicle located at a start address is positioned in a rough position zone including a destination address, which comprises the steps of:

(a) generating a signal having a first non-ambiguous binary value corresponding to said start address;

(b) communicating said signal having said first value to control means for said vehicle;

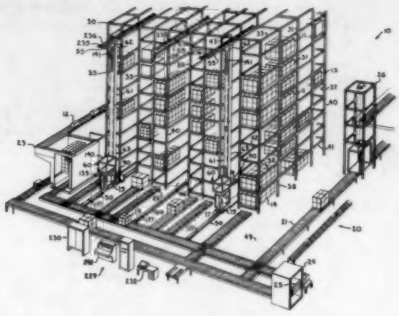
(c) receiving in said control means a second nonambiguous binary value corresponding to said destination address;

(d) comparing in said control means said first and second values;

(e) expanding said second value to a range of nonambiguous binary values corresponding to said rough position zone;

(f) causing with said control means said vehicle to travel from said start address to said rough position zone;

(g) generating a signal having a value within said range; and



(h) communicating said signal having said value within said range to said control means whereby said vehicle is designated as being located in said rough position zone.

4,415,976
METHOD AND APPARATUS FOR AUTOMATIC MILL ZERO CORRECTION FOR STRIP WIDTH

John W. Cook, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1981, Ser. No. 258,342
Int. Cl.³ G06F *15/46*; B21B *37/00*
U.S. Cl. 364—472 **19 Claims**

1. A method of presetting the roll stands of a rolling mill comprising the steps of:

closing the roll gap of a roll stand until a desired roll force RF is developed between the rolls;

determining the actual mill stretch RF/M_1 of the empty mill modulus for said desired roll force at said stand;

determining for said desired roll force the actual mill stretch RF/M_2 of the mill modulus at said stand if loaded with a strip of material of a given width;

calculating the quantity $\Delta S=(RF/M_1-RF/M_2)$;

determining for a desired strip thickness DT a desired roll gap opening H_1 by the relation $H_1=DT-(S_1-S_0)$, where S_0 is the separation of the rolls when the mill is empty and S_1 is the separation of the rolls when the mill is loaded; and

opening the roll gap of said stand by an amount sufficient to reach said desired roll gap opening.

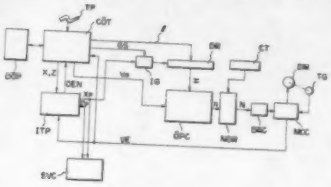
4,415,977
METHOD OF CONSTANT PERIPHERAL SPEED CONTROL

Hiroomi Fukuyama, Hachioji, and Shinichi Isobe, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

PCT No. PCT/JP80/00150, § 371 Date Mar. 2, 1981, § 102(e) Date Feb. 20, 1981, PCT Pub. No. WO81/00073, PCT Pub. Date Jan. 22, 1981
PCT Filed Jun. 30, 1980, Ser. No. 243,928
Claims priority, application Japan, Jun. 30, 1979, 54-82779
Int. Cl.³ B23Q *15/10*; G05B *19/18*; G06F *15/46*
U.S. Cl. 364—474 **6 Claims**

1. An improved method of constant peripheral speed control

for a workpiece supported on a spindle, of the type wherein a distance value corresponding to the distance between the spindle axis and a tool for cutting the workpiece is stored in a memory means, the stored content is revised in response to movement of the tool, and a signal for rotating the spindle at an RPM which imparts a constant peripheral speed to the workpiece is determined based on a commanded peripheral speed and the content stored in the memory means, wherein the



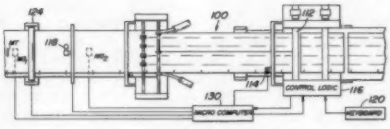
improvement comprises: inhibiting the revision of said stored content when the tool is moved on the basis of a rapid-advance command; storing in said memory means a numerical value corresponding to the distance between a position at which the tool starts moving at a speed other than the rapid-advance speed and the axis of the spindle; determining the RPM for the spindle based on said numerical value and the commanded peripheral speed, and driving the spindle to rotate it at said RPM before the tool reaches said position.

4,415,978

CUT-TO-MARK CUT-OFF CONTROL AUTOMATED FOR SPLICE AND ORDER CHANGE

Robert H. Craemer, Cherry Hill, and A. Brent Woolston, Palmyra, both of N.J., assignors to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Apr. 14, 1981, Ser. No. 254,226
Int. Cl.³ B26D *5/36;* **G06F** *15/20*
U.S. Cl. 364—475 **12 Claims**



1. A method for automatic control of a cut-off machine at the transition of a splice in a web comprising:

(a) cutting a moving web at index marks thereon by a cut-off machine;

(b) applying a target capable of being sensed to an idle web adjacent an initial index mark thereon, splicing the idle web to the moving web;

(c) sensing said target when it appears at a first location upstream from the cut-off machine and generating a signal; thereafter, severing the web transversely in response to the signal and creating a gap between leading and trailing portions of the web;

(d) sensing said target when it appears at a second location upstream of the cut-off machine; thereafter, sensing displacement of the trailing portion of the web and generating a series of signals representative of extrapolated positions of the target upstream of said cut-off machine based on sensing the target at the second location and sensing displacement of the trailing position of the web;

(e) synchronizing the cut-off machine with the index marks on the trailing portion of the web while the cut-off machine is in said gap in response to said series of signals;

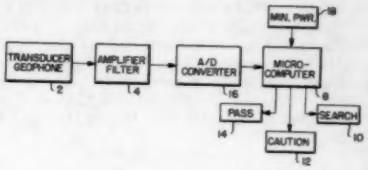
(f) whereby said cut-off machine cuts said trailing portion of the web at said index marks beginning with said initial index mark and operator intervention to make an upstream or downstream adjustment is eliminated.

4,415,979

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF AN ANIMATE BODY IN AN INANIMATE MOBILE STRUCTURE

Walter C. Hernandez, Potomac, Md., assignor to Essco, Inc., Springfield, Va.

Filed Mar. 25, 1981, Ser. No. 247,242
Int. Cl.³ G08B *13/00*
U.S. Cl. 364—508 **14 Claims**



1. A time domain power evaluation method for detecting the presence of an animate body in an inanimate mobile structure which includes:

a. sensing the mechanical vibrations emanating from a mobile structure and deriving therefrom an electrical signal which is a function of such vibrations;

b. sampling said electrical signal during a plurality of equal time periods and obtaining the power level of said sampled electrical signal during said equal time periods;

c. determining whether an accumulation of power levels of a selected magnitude exists within a selected power range of power levels close to but above the lowest power level obtained during said sampled time periods;

d. determining whether said lowest power level is above a predetermined minimum power level;

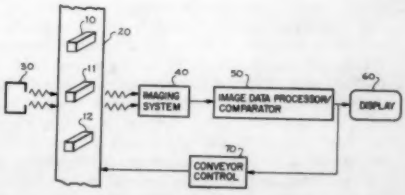
e. and providing an output indication in the presence of an accumulation of power levels at or in excess of said selected magnitude in said selected power range when said lowest power level is above said predetermined minimum power level.

4,415,980

AUTOMATED RADIOGRAPHIC INSPECTION SYSTEM

Robert A. Buchanan, Palo Alto, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Mar. 2, 1981, Ser. No. 239,611
Int. Cl.³ G06F *15/46;* **H04N** *5/32*
U.S. Cl. 378—58 **11 Claims**



1. A method of determining structural conformity of a test object to a reference object for quality control of manufactured objects, said method comprising the steps of:

(a) transmitting X-ray radiation through said reference object to phosphor means for generating an optical signal,

which is converted to an electronic image of said reference object;

(b) transmitting x-ray radiation through said test object to phosphor means for generating an optical signal, which is converted to an electronic image of said test object; and

(c) subtracting one of the aforesaid electronic images from the other to produce a subtractive image in which any significant structural difference between said test object and said reference object appears in sharp detail.

4,415,981

MULTI-PURPOSE TERMINAL DEVICE HAVING AN INPUT AND CONTROL KEYBOARD FOR CONNECTION TO A DATA PROCESSING SYSTEM AND/OR TO AN AUTOMATIC TEXT PROCESSING UNIT

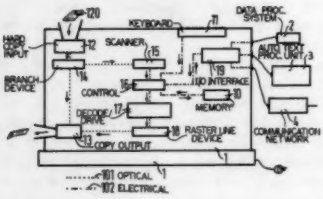
David Cutter, and Hans Unterberger, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 3, 1981, Ser. No. 250,536

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019480

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—518 **25 Claims**



1. A multi-purpose terminal device for connection of external devices including a data processing system, an automatic text processing unit and a communication network, comprising:

a hard copy input device for receiving and optically scanning an original to produce optical information and transmit the same over a first optical path;

a branching device in the first optical path for passing a first portion of the optical energy along the first optical path and branching a second portion of the optical energy along a second optical path;

a copy output device coupled to the first optical path and operable in response to the first portion of the optical energy to produce a hard copy of the original;

a keyboard operable to produce a plurality of command signals; and

interface means for coupling the external devices to said branching device over the second optical path and to said copy output device over a third optical path, said interface means including an interface device for connection to the external devices, an electrical signal generator coupled to the second optical path, an optical signal generator coupled to the third optical path and operable in response to input signals to transmit optical energy to operate said copy output device, and a memory for storing information, said interface means further including control means responsive to command signals to selectively interconnect via said interface device, the external devices with said electrical signal generator for transmitting outgoing information and with said optical signal generator for receiving incoming information and to selectively connect the external devices and said electrical signal generator to said memory for temporary storage of the respective incoming and outgoing information.

4,415,982

SCINTILLATION CAMERA

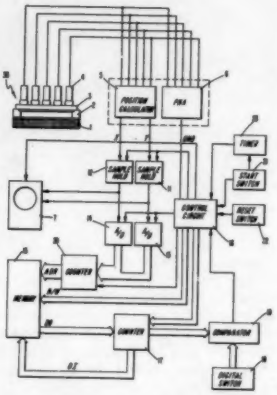
Mineki Nishikawa, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 27, 1981, Ser. No. 229,002

Claims priority, application Japan, Jan. 31, 1980, 55-10244

Int. Cl.³ H04N *5/66*

U.S. Cl. 364—527 **5 Claims**



1. A scintillation camera apparatus including a camera head for detecting, in a matrix of points, radiation emitted from radioactive materials distributed in a subject and generating electric signals corresponding with said emitted radiation, said camera including a collimator, a scintillator, and a plurality of photomultipliers, position-calculating apparatus for calculating the radiation incidence position of an electric signal from said camera head, a pulse-height analyzer for generating an unblanking signal only when the emitted radiation exceeds background noise and display apparatus for reflecting the electric signals generated by the camera head, the improvement comprising:

a memory having a plurality of addresses corresponding to the points of the matrix detected by said camera head;

an address-designating apparatus supplied with the radiation incidence position from the position-calculating apparatus for issuing a signal designating the address in said memory corresponding to each radiation incidence position signal received and for driving the memory position to a successive position;

control apparatus;

means for transmitting said unblanking signal to said control apparatus;

means triggered by the receipt of said unblanking signal by said control apparatus for comparing the content at the address designated by the address-designating apparatus with a predetermined minimum of acceptable radiation, said comparing means generating a first signal representing that said content of the memory at the designated address is less than said predetermined minimum value and a second signal representing that said content is at least equal to said predetermined minimum value;

means for transmitting said first and second signals from said comparing means to said control apparatus, said control apparatus, (1) upon receipt of said first signal, adding one, representing said received designation signal, to said content and returning the increased content to the designated address, and, (2) upon the receipt of the second signal, issuing the unblanking signal to said display apparatus at the corresponding point of the display apparatus; and

timing means for shutting off access of said unblanking signals to said display apparatus at a predetermined time, whereby said display apparatus reflects only radiation at

least equal to said predetermined minimum at said predetermined time.

4,415,983

SYSTEM AND METHOD FOR ALIGNING A DISPLAY DEVICE

Leonard P. Lachmann, and Cesario S. Garza, Jr., both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 4, 1980, Ser. No. 127,021
Int. Cl.³ G06F 1/00; H05K 1/14
U.S. Cl. 364—708 23 Claims

1. A system for aligning an electrically-responsive display device having a plurality of electrically conductive terminals with respect to a substrate member to effectuate electrical interconnection between said display device and an electrical circuit member mounted on said substrate member, said system comprising:

(a) an insulative substrate member having a plurality of electrical conductors formed thereon, each of said electrical conductors being electrically connected to said electrical circuit, said substrate member further including a plurality of openings extending therethrough;

(b) spacer material having a pattern of electrical conductors on a surface thereof, said spacer member being disposed adjacent to said substrate member with said electrical conductors on said surface thereof in electrical contact with respective ones of said plurality of electrical conductors of said substrate member; and

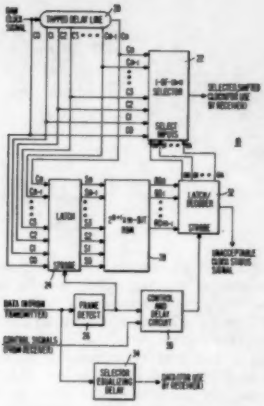
(c) a base member for retaining said display device in a fixed position between said base member and said insulative substrate member, said base member including a plurality of alignment posts extending outwardly therefrom for mating with respective openings of said substrate member, said base member being mechanically biased toward said substrate member thereby biasing said display device toward said spacer material and said spacer material toward said substrate member for electrically connecting said electrically conductive terminals to said electrical conductors of said spacer material thereby electrically connecting said electrically conductive terminals to respective ones of said electrical conductors of said substrate member and for mechanically holding said display device, said base member further including a flexible spring member for exerting biasing pressure on said display device in a direction perpendicular to said biasing of said display device toward said substrate member to maintain said display device in a fixed position with respect to a predetermined reference position on said base member thereby facilitating alignment of said display device with said substrate member.

4,415,984

SYNCHRONOUS CLOCK REGENERATOR FOR BINARY SERIAL DATA SIGNALS

Dana A. Gryger, Downingtown, and Daniel P. Drogichen, West Chester, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 25, 1980, Ser. No. 162,806
Int. Cl.³ G06F 7/28, 5/06
U.S. Cl. 364—900 12 Claims



1. A synchronous clock regenerator for generating a clock signal for strobing a sequence of binary serial data, the beginning of said sequence of binary serial data including a framing pattern, said sequence of binary serial data have associated with it a raw clock signal of the same frequency as said binary serial data, said clock regenerator comprising:

delay means to delay said raw clock signal for generating a plurality of delayed versions of said raw clock signal;

address generating means, initiated by the occurrence of said framing pattern, for generating a set of signals from said generated plurality of delayed versions of said raw clock signal, said set of signals representing a generated address;

storage means, responsive to said generated address, for supplying stored data specifying one of said versions of said raw clock signal including said raw clock signal at the clock signal to be generated; and

selection means coupled to both said delay means and said storage means, for gating as said generated clock signal the one of said generated plurality of delayed versions of said raw clock signal as specified by said stored data.

4,415,985

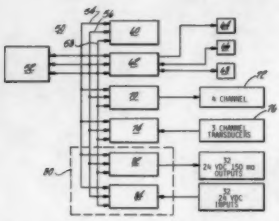
DRIVING CIRCUIT FOR CATHODE RAY TUBE

George H. McDaniel, Northville, and Thomas W. Hartford, Livonia, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 28, 1980, Ser. No. 182,202
Int. Cl.³ G06F 3/153
U.S. Cl. 364—900 3 Claims

1. A character display system of the type including interactive display data means for displaying and entering character data within the system; central control means for generating character data signals to be displayed to an operator via the interactive display data means, for generating command signals, for storing address information and for communicating the address information to the interactive display data means via a bus structure, said central control means further including means for transferring data to said interactive display data means, the interactive display data means including display controller means for requesting and receiving character data

from said central control means and for generating line control command and timing signals to cause a dot matrix of characters to be written on a display means such as a cathode ray tube; memory means responsive to control signals for storing a predetermined dot matrix of characters to be generated and for outputting said dot matrix of characters in response to modified line control signals characterized in that the system includes decoder means responsive to each received line control signal for generating modified line control signals wherein said decoder means comprises a PROM having its address locations



divided into at least two portions, the first portion of said PROM addressable to produce each modified line control signal in direct correlation with the received line control signal for causing said memory means to output a particular line of dot characters of the dot matrix in a single line mode, and the second portion of said PROM addressable to generate two modified line control signals for each received line control signal for causing said memory means to output a particular line of dot characters of the dot matrix twice in a double line mode.

4,415,986

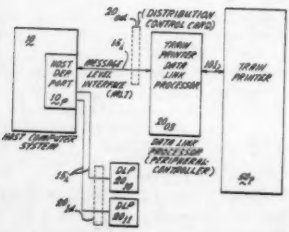
DATA FLOW CONTROL SYSTEM

David P. Chadra, Anaheim, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 147,508, May 7, 1980, Pat. No. 4,357,681. This application Aug. 4, 1982, Ser. No. 405,045

Int. Cl.³ G06F *3/12, 11/10*

U.S. Cl. 364—900 **7 Claims**



1. In a network wherein a main host computer communicates to a train printer peripheral unit via an I/O subsystem having a plurality of peripheral-controllers housed in a base module, said base module having a backplane connection means for slide-in connection of cards holding a plurality of peripheral-controllers and a maintenance card checking means, and foreplane connection means, wherein each of said peripheral-controllers is made of a common-front-end circuit card and a peripheral dependent board card linked by said foreplane connection means, the combination comprising:

(a) a distribution control circuit card connected to said backplane connection means of said base module, said distribution control circuit card including:

(a1) bus connection means to said main host computer;

(a2) logic means, responsive to said main host computer or one of said peripheral controllers, to connect or disconnect said main host computer with a selected peripheral-controller;

(b) a train-printer peripheral-controller connected to said backplane connection means, and providing print-control signals to said train-printer peripheral unit, said train printer peripheral-controller including:

(b1) means for enabling data flow between said peripheral-controller and said main host computer or between said peripheral-controller and said maintenance card means, said means selecting direction of flow according to control signals initiated by said peripheral-controller;

(b2) maintenance bus means connecting said maintenance card means, via said backplane connection means, to a memory storage means in said train-printer peripheral-controller;

(b3) data bus line connection means between said distribution control circuit card and said memory storage means in said train-printer peripheral-controller;

(b4) memory storage means for storing data to be transferred and data for operation and control of said train-printer peripheral unit, said memory storage means being connected to:

(i) said data bus line connection means for receipt of data and for output of data;

(ii) said maintenance bus means for receipt of data and for output of data.

4,415,987

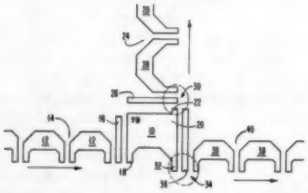
MAGNETIC BUBBLE PASSIVE REPLICATOR

Thomas W. Collins, Saratoga, and Lung-jo Tao, Cupertino, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,816

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—12 **7 Claims**



1. A passive magnetic bubble replicator for use with first, second and third propagation channels comprising:

a replicator element of a magnetizable material having first, second, third and fourth peripheral corner areas in spaced relation, said first corner area being an input leg portion associated with said first propagation channel, said second corner area for bubble replication associated with said second propagation channel, said third corner area being an output leg portion associated with said third propagation channel, said second corner area separated from said first corner area along the periphery in one direction by said fourth corner area, wherein upon the application of a rotating in-plane magnetic field a first bubble passes from said first propagation channel to said first corner area and then through said fourth corner area to said second corner area where the first bubble is split into second and third bubbles, and said second bubble passing into said second propagation channel, said third bubble passing to said third corner area and then into said third propagation channel.

4,415,988

MAGNETIC BUBBLE MEMORY DEVICE

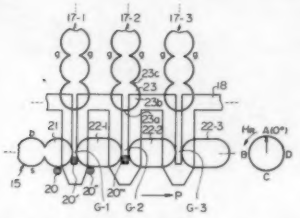
Kazunari Komenou; Tsutomu Miyashita, both of Kawasaki, and Makoto Ohashi, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 14, 1981, Ser. No. 283,182

Claims priority, application Japan, Jul. 15, 1980, 55-97341; Feb. 19, 1981, 56-22207; Feb. 20, 1981, 56-22959; Feb. 20, 1981, 56-22960; Feb. 20, 1981, 56-22961

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—16 **22 Claims**



1. A magnetic bubble memory device comprising:

a magnetic layer having a first region in which the easy axis of magnetization extends in a first direction and a second region surrounding said first region in which the easy axis of magnetization is substantially perpendicular to said first direction, said first and second regions defining a major loop pattern for propagation of information bubbles and a plurality of minor loop patterns for storage of information bubbles, each said minor loop pattern having a first portion in the vicinity of a respective part of said major loop pattern, said major loop pattern having a gap in each said respective part thereof; and

an electrical conductor pattern on said magnetic layer, with an insulating layer therebetween, to form a hairpin-shaped pattern extending between said first portion of each said minor loop pattern and the respective gap in said major loop, wherein transfer gates are thusly provided for transfer of information bubbles between the major loop pattern and the minor loop patterns.

4,415,989

DUAL CONDUCTOR CURRENT ACCESS MAGNETIC BUBBLE MEMORY

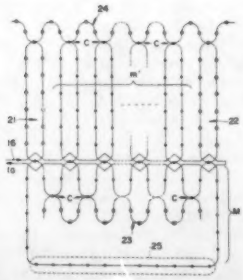
Koji Sakamoto, Yatabemachi, Japan, assignor to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,465

Claims priority, application Japan, Jun. 2, 1980, 55-74095

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—19 **8 Claims**



1. A dual-conductor type current-access magnetic bubble memory having first and second conductors, which comprises:

a major loop constituted by a linear propagation path, formed by a serial train of paired apertures bored in the first and second conductors and zigzag propagation path formed of a serial train of paried apertures bored in the first and second conductors,

a plurality of minor loops each constituted by a serial train of paired apertures bored in said first and second conductors,

a plurality of transfer gates each defined by a pair of apertures and arranged so as to connect the respective minor loops with the major loop on the zigzag propagation path thereof, and

a gate control conductor capable of imparting a magnetic field to the transfer gates consisting of paired apertures, said zigzag propagation path being provided with at least three aperture patterns for propagating bubbles between the adjacent transfer gates, whereby a series of bubbles can be transferred between the major loop and the respective minor loops by applying gate current pulses to said gate control conductor while a current pulse sequence is applied to each of said first and second conductors.

4,415,990

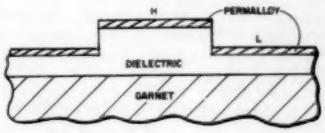
COMPLEMENTARY BI-LEVEL MAGNETIC BUBBLE PROPAGATION CIRCUIT

Isoris S. Gergis, Yorba Linda, and Wai-Tak P. Lee, Santa Ana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 71,449, Aug. 31, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 276,408

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—41 **16 Claims**



1. A magnetic bubble domain device comprising:

a planar layer of magnetic material in which magnetic bubble domains can be propagated;

a bubble domain guide structure coupled to said layer for defining a bubble propagation path for guiding the movement of said bubbles in said layer in response to a cyclical change in the orientation of a reorienting magnetic field within the plane of said layer;

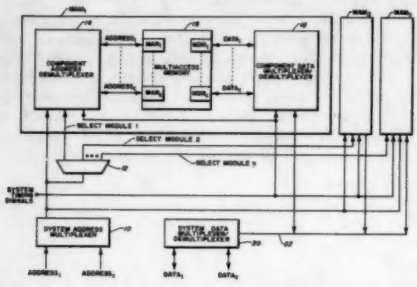
said structure comprising a two-level composite structure including a first pattern of elements responsive to a magnetic field formed as an upper first layer of said structure, and a second pattern of elements responsive to a magnetic field forming a lower second layer of said structure, said first and said second patterns being complementary to each other, said first and second layers being separated by a substantially vertical gap;

said first and second second pattern of elements being operative in response to a rotating field so as to form a potential energy well in said layer of magnetic material in which magnetic bubble domains can be propagated underneath said layers of said guide structure so that as the magnetic field reorients in the plane of the layer, the potential well is translated in said layer of magnetic material in a direction along a path corresponding to the path in the plane of said guide structure of the vertical gap between said upper first layer and said lower second layer.

4,415,991
MULTIPLEXED MOS MULTIACCESS MEMORY SYSTEM

Wesley W. Chu, Pacific Palisades, and David G. Hibbits, Culver City, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 276,439
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—77 **2 Claims**



1. Multiplexed, multiaccess memory system for use with a digital data computer system of a type having a memory formed of a plurality of memory modules each containing data bit storage cells, the computer system further including a digital data processer providing address instructions to memory address multiplexers, the outputs of which are applied to decoders functioning responsively to said instructions to activate particular storage cells of a particular module and permit the logic state of said particular cell to be altered to reflect an instruction, the memory system comprising:

a system address multiplexer having a plurality of inputs for receiving multiple addresses simultaneously from one or more processing units and having one or more addressing outputs

a component address demultiplexer having an input coupled to said system address multiplexer and having a plurality of outputs,

a multiaccess memory having a plurality of memory address registers, each being connected to one of said plurality of outputs of said component address demultiplexer and having a plurality of memory data registers,

a system data multiplexer/demultiplexer having a plurality of terminals for receiving and transmitting data from and to said multiaccess memory according to corresponding specified addresses, and

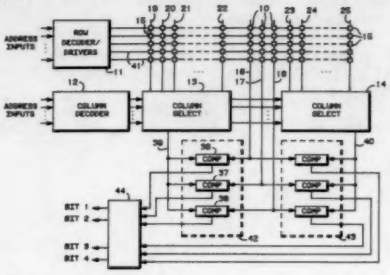
a component data multiplexer/demultiplexer coupled to said data registers and operating as a multiplexer when reading data from said memory data registers and operating as a demultiplexer when writing data into said memory data registers.

4,415,992
MEMORY SYSTEM HAVING MEMORY CELLS CAPABLE OF STORING MORE THAN TWO STATES

Richard H. Adlhoch, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1981, Ser. No. 238,177
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—94 **11 Claims**

10. A memory array having a plurality of rows and columns of memory cells wherein the columns are divided up into groups having an equal number of columns, the memory cells each being capable of storing more than two states; a plurality of columns of reference cells located between adjacent groups of columns of memory cells, the reference cells being substantially identical in physical size to the memory cells; comparator means for receiving memory cell data comparing such data to

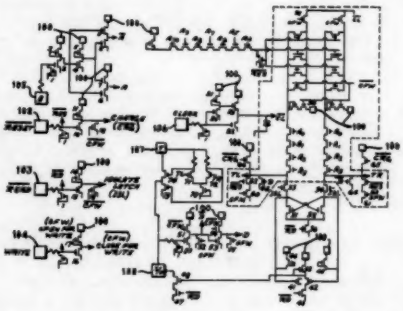


one of the reference cells; and a translator for translating an output from the comparator means to binary data.

4,415,993
FAST ACCESS NON-VOLATILE MEMORY

Philip C. Smith, Columbia, and John L. Fagan, Pasadena, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 23, 1981, Ser. No. 324,349
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—184 **6 Claims**



1. A fast access non-volatile memory apparatus comprising in combination:

a memory means to store a digital bit,

a row decode means operatively connected to said memory means,

a column decode means operatively connected to said memory means, said row decode means and said column decode means cooperating with each other to write and read data into and from said memory means,

a data input means to receive input data, said data input means providing data signals to said row decode means and said column decode means,

a latch means connected to said column decode menas to activate said column decode means,

a reset means to receive a reset signal, said reset means providing said reset signal to said memory means and said row decode means,

a read means to receive a read signal, said read means providing said read signal to said latch means, said read means generating an isolate latch signal, said read means applying said isolate latch signal to said latch means,

a write means to receive a write signal, said write means generating a first and second write signal, said write

means applying said first and second write signal to said memory means,

a clear means to receive a clear signal, said clear means providing said clear signal to said memory means to clear said memory means, and

an input/output means connected to said latch means, said latch means during a read cycle turning said input/output means off if said memory means digital bit is a logical one, and pulling said input/output means on if said memory means digital bit is a logical zero, said input/output means providing said digital bit as an output.

4,415,994

RANDOM ACCESS MEMORY ARRANGEMENTS

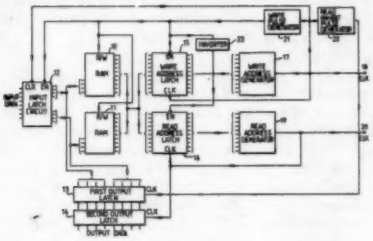
John G. S. Ive, London, and Alan C. Thirlwall, Winchester, both of England, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 302,107

Claims priority, application United Kingdom, Sep. 19, 1980, 8030300

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—189 **7 Claims**



1. A random access memory arrangement comprising:

a random access memory having common read and write data terminals;

means for supplying input data to said read and write data terminals for writing in said random access memory;

a first output latch circuit connected to said read and write data terminals;

a second output latch circuit connected to said first output latch circuit and having an output;

means responsive to a write pulse signal having write pulses, for supplying control signals to said random access memory to enable said random access memory to write said input data therein at given addresses in synchronism with said write pulses of said write pulse signal;

means responsive to a read pulse signal having read pulses, for supplying control signals to said random access memory to enable said random access memory to read output data from given addresses therein in synchronism with said read pulses of said read pulse signal, said read pulse signal being asynchronous with said write pulse signal;

means responsive to said write pulse signal for supplying signals to control said first output latch circuit to hold and to supply to said second output latch circuit data supplied to said first output latch circuit immediately prior to each said write pulse, and to pass therethrough to said second output latch circuit data supplied to said first output latch circuit at all other times; and

means for supplying said read pulse signal to said second output latch circuit for causing the latter to hold the data supplied to said second output latch circuit by said first output latch circuit immediately prior to the beginning of each said read pulse until the beginning of the next succeeding said read pulse and to supply the data so held to said output of said second output latch circuit.

4,415,995

READ AMPLIFIER FOR A BIPOLAR MEMORY MODULE

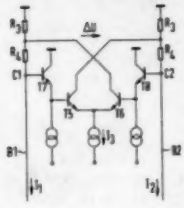
Hans Glock, Höfa, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 295,115

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033174

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—190 **6 Claims**



1. A read amplifier for a bipolar memory module having memory cells arranged in matrix-fashion, the read amplifier evaluating a difference of higher and lower respective read currents in a first and a second bit line of the memory module, comprising: means in said read amplifier for feeding into the bit line with the higher read current an additional current generated by the read amplifier.

4,415,996

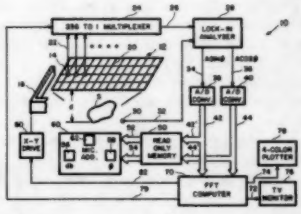
NONWAVELENGTH-LIMITED HOLOGRAPHIC SOUND FIELD RECONSTRUCTION

Julian D. Maynard, Boalsburg, and Earl G. Williams, State College, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1981, Ser. No. 271,871

Int. Cl.³ G03H *3/00*

U.S. Cl. 367—8 **13 Claims**



1. A system for measuring characteristics of a sound source disposed substantially in a first predetermined plane and operative to radiate sonic energy with a propagation wavelength λ out of said plane, said system comprising:

receiving means, presenting an array of receiving points to said source, for receiving said sonic energy at said points and generating electrical signals representative of the acoustic energy received at each of said points, said receiving means having a dynamic range D, and said array lying substantially in a second predetermined plane at a predetermined distance d from said first predetermined plane;

multiplexer means, responsive to said electrical signals, for sampling said signals from each of said points and generating a serialized output representative thereof;

reference means, for providing an electrical reference signal representative of said sonic energy in said first plane;

computer means, responsive to said serialized output and to said reference signal, for performing an inverse Fourier transform thereon; and

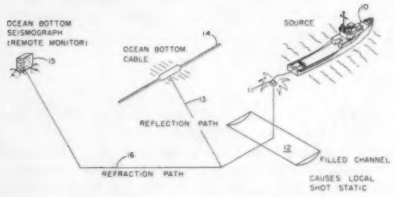
said predetermined distance being less than about 0.04λ, whereby said receiving means is responsive to evanescent waves of said sonic energy and said computer means provides output signals representative of a holographic reconstruction of a predetermined characteristic of said sound source with a resolution $R = 20\pi/DIn$ 10 d.

4,415,997

METHOD FOR DETERMINING SOURCE AND RECEIVER STATICS IN MARINE SEISMIC EXPLORATION

Jack L. Wilson, Slidell, La., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,286
Int. Cl.³ G01V *1/38, 1/28*
U.S. Cl. 367—15 **3 Claims**



1. A method for seismic exploration at a marine exploration site having an anomalous near surface low velocity layer below the water bottom, comprising the steps of:

(a) deploying a marine seismic detector cable along a seismic exploration line for which seismic reflection signals traveling to said seismic detector cable pass through a near surface low velocity layer,

(d) deploying a marine seismic monitor at a distance remote from said seismic detector cable such that the first energy received at said monitor consists of seismic refraction signals which have passed through said near surface low velocity layer, and

(c) generating first seismic energy at an offset distance from said seismic detector cable so as to produce a first seismic signal which travels downward into the earth, is refracted through the earth, and travels upward through said near surface low velocity layer to intersect said seismic detector cable in a generally orthogonal direction, whereby said first seismic signal, as received by said detector cable, includes a receiver statics component attributable to said near surface low velocity layer,

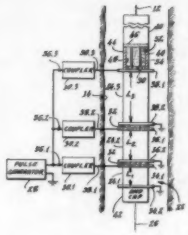
(d) generating second seismic energy so as to produce a second seismic signal which travels downward through said near surface low velocity layer into the earth, is (i) refracted through the earth and detected by said remote seismic monitor, said refracted second seismic signal including a source statics component attributable to said near surface low velocity layer and (ii) reflected from the earth and detected by said seismic detector cable at the same time said refracted second seismic signal is detected by said remote seismic monitor.

4,415,998

SEGMENTED ACOUSTIC TRANSMITTER FOR BROAD FREQUENCY INVESTIGATION OF A BOREHOLE

Robert B. Blizard, Littleton, Colo., assignor to Schlumberger Technology Corp., New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 131,241
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—25 **7 Claims**



1. A segmented acoustic transmitter for generating an acoustic pulse for use in an acoustic investigation of a borehole penetrating an earth formation with a multiple sonic receiver tool comprising

a plurality of individually energizable cylindrical acoustic transmitter segments having active surfaces from which acoustic energy radiates, said acoustic transmitter segments being generally coaxially aligned along a common axis with their acoustically active surfaces radiating acoustic energy in a generally common direction, said acoustic transmitter segments being located axially in proximity to each other to enable generation of a composite acoustic impulse in said common direction when said acoustic transmitter segments are electrically energized, with said transmitter segment surfaces as measured along said common axis, being of successively different and larger lengths and with the respective lengths selected in accordance with a predetermined relationship with each other wherein the lengths of said segment surfaces are whole multiples of the shortest surface length employed for one of said acoustic transmitter segments and with said whole multiples being at least two and three to impart to said composite acoustic pulse with a desired frequency bandwidth, with the segment having the largest length being located nearest to sonic receivers on said tool;

means for driving said segments with a common electrical pulse, said driving means including:

a pulse generator, a plurality of differently sized inductances respectively in series between a segment and said pulse generator, the inductances being selected to operate said segments in respective resonances.

4,415,999

METHOD OF CONFIRMING SEISMIC DATA INTERPRETATION

George P. Moeckel, Houston, and George C. Wallick, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,288
Int. Cl.³ G01V *1/30*
U.S. Cl. 367—73 **9 Claims**

1. Method for exploring the subterranean structure of the earth comprising the steps of:

imparting acoustic energy to the earth at a first shot point location;

detecting return of said energy at a plurality of detector locations;

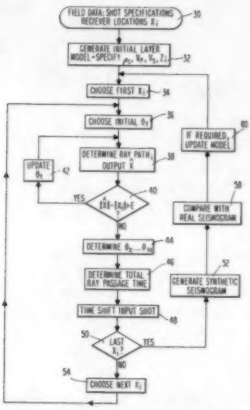
generating a real seismogram using the outputs of said detectors;

generating a model of the subterranean structure of the earth

based on said real seismogram, said model including definition of rock layers as to thickness and the velocity of acoustic waves therein;

determining the paths of plural model acoustic rays corresponding to said acoustic energy through said model structure with ray path terminations defined to be located at points chosen to correspond to said detector locations;

determining the time required for a ray to pass along the determined paths of said model acoustic rays;



time-shifting said model rays in accordance with said determinations of time;

producing a synthetic seismogram exhibiting the results of said time-shifted operations; and

comparing said synthetic seismogram and said real seismogram to yield a result indicative of the accuracy of said model.

4,416,000

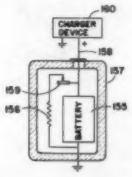
SYSTEM FOR EMPLOYING HIGH TEMPERATURE BATTERIES FOR MAKING MEASUREMENTS IN A BOREHOLE

Serge A. Scherbatskoy, Tulsa, Okla.

Division of Ser. No. 121,804, Feb. 15, 1980, abandoned, which is a continuation of Ser. No. 857,677, Dec. 5, 1977, abandoned. This application Apr. 12, 1982, Ser. No. 367,265

Int. Cl.³ G01V *1/40*

U.S. Cl. 367—81 **15 Claims**



1. A system for making measurements in an earth borehole having an improved power source, comprising:

downhole apparatus including means for sensing the magnitudes of one or more downhole parameters and generating signals representing the magnitudes of such parameters;

equipment at the earth's surface for detecting said signals and translating said detected signals into indications representative of the magnitudes of said downhole parameters;

a battery within said downhole apparatus of a type that is operable only at temperatures substantially higher than those encountered in above-ground ambient air;

a heat source for maintaining the temperature of said battery within its operable range; and

a thermostat responsive to the battery temperature, said heat source and thermostat being connected to said battery whereby voltage supplied by said battery at least in part provides heat necessary to maintain said battery at operating temperatures during low ambient temperature conditions, said thermostat operating to remove battery voltage from said heat source when the ambient temperature is above a level which maintains said battery within its operable temperature range.

4,416,001

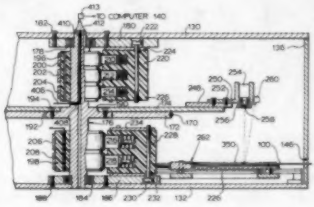
METHOD AND APPARATUS FOR OPTICALLY READING DIGITAL DATA INSCRIBED IN AN ARCUATE PATTERN ON A DATA CARRIER

Richard C. Ackerman, Glenview, Ill.; Alan A. Jewer, and Donovan W. Hurlbut, both of Whitewater, Wis., assignors to News Log International, Inc., Ft. Atkinson, Wis.

Filed Nov. 26, 1980, Ser. No. 210,847

Int. Cl.³ G11B *7/00, 21/10*

U.S. Cl. 369—44 **76 Claims**



1. Apparatus for reading a data record on which the data is inscribed in an arcuate pattern of equal-radii circular segment spaced lines on a data carrier, comprising:

a data carrier support for receiving and holding a data carrier;

a light source operable to emit a beam of light;

beam directing means for receiving and directing the beam of light toward the supported data carrier, including sweep means for repetitively sweeping the light beam across the data carrier in an arc corresponding to a line of the arcuate pattern;

a carriage mounting said data carrier support for movement radially of the arcuate pattern;

incrementing means connected to said carriage and operable between sweeps of the light beam to step said support a distance equal to the line spacing so that the light beam scans one line after another; and

receiving means mounted to receive the light beam after the same strikes the data carrier.

4,416,002

METHOD AND APPARATUS FOR HIGH-DENSITY RECORDING AND REPRODUCTION

Masanori Oguino; Tooru Fujishima, both of Yokohama, and Jun Matsumoto, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 28,706, Apr. 10, 1978, abandoned. This application Mar. 29, 1982, Ser. No. 363,147

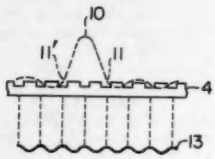
Claims priority, application Japan, Apr. 10, 1978, 53-41178; Dec. 22, 1978, 53-157462

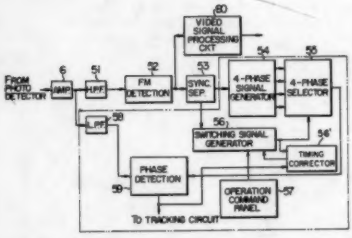
Int. Cl.³ G11B *21/10, 27/28*

U.S. Cl. 369—44 **8 Claims**

1. A high density system comprising means for recording a high frequency signal modulated with an information signal as

a pit array on a recording medium in time sequence along a multiplicity of tracks adjacent to each other, the pit arrays of the tracks being arranged so that the track pitch of the pit arrays is less than an information reproducing element width thereby providing high density recording on the recording medium, said information signal including a synchronzing signal, said recording means recording said modulated high frequency signal by superimposing a discrimination signal on





said modulated high frequency signal to modulate the duty factor of each pit in the array in accordance with said discrimination signal, said recording means including means for generating said discrimination signal having a frequency spectrum lower than that of said modulated high frequency signal and having a predetermined phase difference between the adjacent tracks, said discrimination signal frequency having a predetermined relation with respect to the frequency of said synchronizing signal.

4,416,003

BOTH SIDE RECORD PLAYER

Hiroyuki Suzuki, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1981, Ser. No. 291,805

Claims priority, application Japan, Aug. 13, 1981, 56-2812; Aug. 13, 1981, 56-2813; Aug. 13, 1981, 56-2814; Aug. 13, 1981, 56-2815; Aug. 13, 1981, 56-2816; Aug. 13, 1981, 56-2817

Int. Cl.³ G11B *17/04, 3/62*

U.S. Cl. 369—75.2 **10 Claims**

1. A record player for selectively playing either side of a disc record comprising:

a player body;

a turntable including a turntable shaft being operatively mounted in a vertical direction within said player body;

a first vertical linear tracking type record reproduction assembly operatively mounted in said player body;

a record mount for initially receiving a disc record being pivotally mounted to said player body for rotating said disc record into engagement with said turntable shaft;

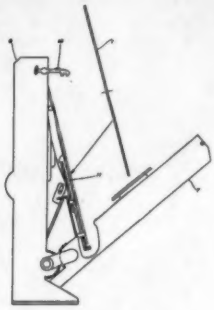
a lid pivotally mounted to said player body;

a second vertical linear tracking type record reproduction assembly operatively mounted in said lid;

common drive means for selectively imparting linear motion to said first and second vertical linear tracking type record reproduction assemblies from a preselected point on said record disc to a central point on said record disc; and

plunger means for selectively imparting motion to either said first vertical linear tracking type record reproduction assembly or said second vertical linear tracking type record reproduction assembly from a non-engaging position to a position in engagement with said disc record;

wherein rotation of said lid to a closed position relative to said player body rotates said record mount to engage said



disc record with said turntable shaft and disengage said record mount from said disc record thereafter said plunger means and said common drive means may be actuated to selectively play a recording from either side of said disc record.

4,416,004

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS HAVING A LID MEMBER GUIDING MECHANISM

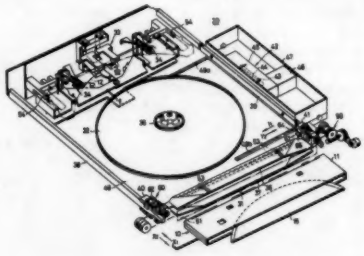
Takashi Saito, Ayase, and Takashi Kumaki, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 19, 1981, Ser. No. 294,304

Claims priority, application Japan, Aug. 20, 1980, 55-117738[U]

Int. Cl.³ G11B *25/04*

U.S. Cl. 369—77.2 **5 Claims**



1. Apparatus for reproducing information signals from a rotary recording medium accommodated within a case, said case having a jacket with a space for accommodating said rotary recording medium and an opening through which said rotary recording medium can enter and leave said jacket, and a lid member inserted through said opening of said jacket for closing said opening, said lid member having a locking edge and a pair of ends remote from said edge, said reproducing apparatus comprising:

means for defining an inserting opening through which said case or an empty jacket is inserted;

turntable means for rotating said rotary recording medium after it is left within said reproducing apparatus when an operation is performed in which said case is inserted into

said reproducing apparatus and then said jacket is pulled from said reproducing apparatus;

lid member locking means located at an innermost part of said reproducing apparatus for locking and retaining said lid member within said reproducing apparatus when an operation is performed in which said case is inserted into said reproducing apparatus and then pulled out from said reproducing apparatus; and

lid member guiding means for guiding said lid member locked by said lid member locking means and retained within said reproducing apparatus and for correcting the position of said lid member so that said lid member opposes the opening of said jacket at an intermediate point during an insertion of an empty jacket into said reproducing apparatus to recover said rotary recording medium within said reproducing apparatus into said jacket,

said lid member guiding means comprising a pair of guide pieces each having an upper and a lower guide member for putting both ends of the locked lid member between said guide members and restricting upward and downward displacement of said lid member, by reason of said guide pieces moving and approaching the locked lid member from a vicinity of said inserting opening, in response to an operation in which the empty jacket is inserted into said reproducing apparatus through said inserting opening.

4,416,005

STYLUS FOR TRACKING A STEREOPHONIC OR QUADRAPHONIC SOUND GROOVE

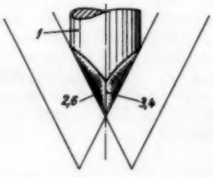
Aalt-Jouk van den Hul, Hertog-Govertkade 10, Delft, Netherlands

Continuation of Ser. No. 41,666, May 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 818,903, Jul. 25, 1977, abandoned. This application Jul. 28, 1981, Ser. No. 287,592

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.³ G11B *3/44*

U.S. Cl. 369—173 **16 Claims**



1. A stylus for tracking the sound groove of a stereophonic or quadraphonic record, said stylus having a longitudinal axis and having a mounting part and a taper, said taper being formed by a pair of convex curved continuous surfaces intersecting along a continuous arc disposed in both surfaces and having a substantially constant angle of intersection along said arc, said surfaces being symmetricl about a plane that includes said arc and said axis, said intersection of said surfaces being slightly rounded in the direction normal to said arc, said arc being tangent at a midpoint thereof to a plane normal to said axis.

4,416,006

RECORD DISC PLAYING APPARATUS HAVING THE FUNCTION FOR CORRECTING ROTATIONAL IRREGULARITIES DUE TO RECORD DISC ECCENTRICITY

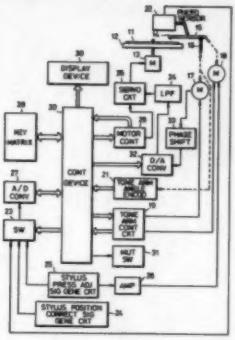
Masatsugu Kitamura, 1046-15, Tomuro, Atsugi-City, Kanagawa-Ken; Hideo Onoe, Dorumi Tsuruma 708, 2-11-28 Nishitsuruma, Yamato-City, Kanagawa-Ken; Fumiaki Ohno, 2-10-502 Zengyoh-Danchi, 3768-3, Fujisawa, Fujisawa-City, Kanagawa-Ken; Tsuyoshi Ono, 2-14-12, Nishitsuruma, Yamato-City, Kanagawa-Ken; Yukihiro Kishima, 4097-18, Kaminagaya-Cho, Konan-Ku, and Yutaka Morita, No.413, Sakuragaoka, Hodogaya-Ku, both of Yokohama-City, Kanagawa-ken, all of Japan

Continuation of Ser. No. 170,972, Jul. 18, 1980, abandoned. This application Jul. 29, 1982, Ser. No. 403,022

Claims priority, application Japan, Jul. 21, 1979, 54-92989

Int. Cl.³ G11B *17/00, 19/24*

U.S. Cl. 369—240 **6 Claims**



1. A record disc playing apparatus comprising:

(a) a tone arm having a reproducing stylus for tracing a sound groove of a record disc said tone arm being mounted for rotation on a shaft;

(b) digital address signal generating means comprising address means bearing a plurality of digital addresses and address reader means disposed in facing relationship to said address means and configured to selectively read one of the digital addresses, the selection of such an address to be read depending on the relative angular position of said reader means with respect to said address means, one of said address means or said reader means being mechanically coupled to the shaft of said tone arm, so that said digital address signal generating means produces as an output a set of unique digital address signals, each such address signal corresponding to a unique horizontal rotational angular position of said tone arm;

(c) means for generating a rotational angular velocity signal which is independent of said digital address signal generating means, said rotational angular velocity signal corresponding to the horizontal rotational angular velocity of the tone arm independent of the angular positions of the tone arm, said rotational angular velocity signal corresponding to the quantity of any eccentricity of said record disc;

(d) means for controlling the rotation of a motor driving a turntable on which the record disc is mounted;

(e) a control device supplied with said digital address signals and having a memory device from which is read out information corresponding to the desired attenuation quantities indicated by said digital address signals, said control device producing output signals based on said information thus read out;

(f) attenuation means supplied with said rotational angular velocity signal and operating with an attenuation quantity,

with respect to said rotational angular velocity signal, which quantity is varied by a signal from said control device; and

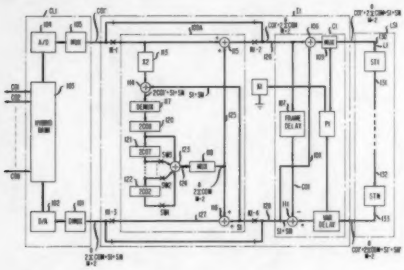
(g) said attenuation means supplying an output signal to said means for controlling the rotation of a motor, the rotation of said motor being so controlled that a rotational irregularity due to any eccentricity of said record disc is corrected for.

4,416,007

DIGITAL CONFERENCING METHOD AND ARRANGEMENT

Donald D. Huizinga, and Paul W. Thompson, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,416
Int. Cl.³ H04M *3/56*
U.S. Cl. 370—62 **20 Claims**



9. In a time division multiplex (TDM) communication system having at least N binary signal communication time slots, a method of forming a signal during each time slot of a preselected group of N time slots representing the sum of the binary signals of the N−1 remaining time slots of said preselected group of said method characterized by the steps of

serially inputting a binary signal into a N−1 binary signal storing means during each time slot of said preselected group and

serially generating during each time slot of said preselected group a sum of the N−1 previously stored binary signals during the serial inputting of a binary signal into said N−1 binary signal storing means.

4,416,008

DUAL LOOP TYPE DATA HIGHWAY SYSTEM

Masahiro Takahashi; Takuji Hamada, and Hitoshi Fushimi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,842
Claims priority, application Japan, Dec. 20, 1979, 54-164828
Int. Cl.³ H04J *3/08*
U.S. Cl. 370—88 **5 Claims**

1. A dual loop type data highway system comprising:

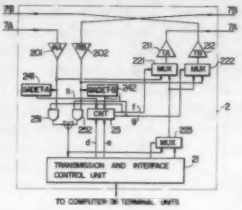
a data highway including at least two loops for data transmission and reception;

a plurality of data transmitting/receiving stations serially connected to said data highway; and

a control station serially connected to said data highway;

said data transmitting/receiving stations each having, for each of said loops, means for detecting the beginning of a transmission cycle,

said control station having, for each of said loops, means for detecting the end of the transmission cycle and means for permitting the transmission/reception of data between a



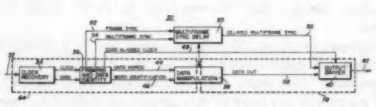
specified two of said data transmitting/receiving stations on one of said two loops during the transmission cycle.

4,416,009

SYNCHRONOUS COUPLING OF FRAMED DATA IN DIGITAL TRANSMISSION

Charles E. Huffman, and Stephen R. Southerland, both of Plano, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1980, Ser. No. 206,937
Int. Cl.³ H04J *13/00*
U.S. Cl. 370—100 **10 Claims**



1. A synchronization system for data coupling apparatus in a digital transmission system carrying data in a given framing format on a transmission medium, comprising:

input means for receiving from said transmission medium a data stream in said framing format and outputting said data of the data stream, said input means further including means for extracting clock signals from the data stream, for aligning said clock signals and the data of the data stream, and for outputting the aligned clock signals, and means for deriving framing identification signals from the data stream and separately outputting the derived signals;

data manipulation means for processing data from said input means to perform a given function on it, said data manipulation means responding to said clock signals to maintain free alignment of the data;

synchronization delay means responsive to said input means for delaying said framing identification signals by a predetermined increment such that a framing identification signal synchronously aligns with its appropriate frame in data processed by said manipulation means; and

output means responsive to said clock signals and said delayed framing identification signals, for delivering data from the manipulation means to said transmission medium in accordance with said frame alignment maintained by said manipulation means.

4,416,010

DOUBLE ERROR CORRECTING SYSTEM IN DIGITAL SIGNAL REPRODUCING APPARATUS

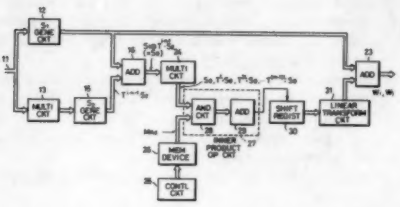
Chitoshi Hibino; Harukuni Kobari; Susumu Suzuki, all of Yokohama, and Yasuhiro Yamada, Fujisawa, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 14, 1981, Ser. No. 254,053

Claims priority, application Japan, Apr. 14, 1980, 55-49004; Apr. 18, 1980, 55-51413

Int. Cl.³ G06F 11/10

U.S. Cl. 371—37 9 Claims



1. A double error correcting system in a digital signal reproducing apparatus, which transmits information in units of blocks where one block consists of a total of (n+2) vectors, said total of (n+2) vectors being formed from n (n is an integer greater than zero) information vectors W_1 through W_n, each having m (m is an integer greater than zero) elements in GF(2), where GF(2) represents a finite field consisting of two elements, and two error correcting column vectors P and Q produced by use of said information vectors W_1 through W_n and an m by m regular linear transformation matrix T which is linearly independent of a unit matrix I, and said correcting system performing a correcting operation when two erroneous vectors W_i and W_j are detected within one block by use of error pointers which indicate which vectors are in error upon reception of the transmitted information, where it is defined that an m number of m by m matrices T^{L1}, T^{L2}, . . . T^{Lm} are linearly independent of each other with respect to said transformation matrix T and m integers L_1, L_2, . . . , L_m which constitute an arithmetical progression, and that M_k is an m by m matrix $(I \oplus T^{i-j})^{-1}$ or $(T^{Gj-Gi} \oplus T^{Hj-Hi})^{-1}$ where symbols "⊕" represent vector addition on GF(2) and k described by an equation k=f(i, j) can assume a plurality of values according to the combination of the values of i and j, and further, that said matrix M_k has m row matrices M_{k1} through M_{km} respectively having m elements, said double error correcting system comprising:

an input terminal for receiving said information vectors W_1 through W_n and said error correcting vectors P and Q;

memory means for storing a plurality of row matrices M_{kd} which are formed from certain predetermined row matrices of said row matrices M_{k1} through M_{km} according to each value of k, for selectively reading out said row matrices M_{kd} according to the value of k;

generating circuit means responsive to said information vectors W_1 through W_n and said error correcting vectors P and Q received at said input terminal, said generating circuit means generating a column vector S_0 which is used for correcting where $S_0 = S_1 \oplus T^{i-n-1} \cdot S_2$ or $T^{-Gi} \cdot S_1 \oplus T^{-Hi} \cdot S_2$, said correction producing partial syndromes S_1 and S_2 from said information vectors W_1 through W_n and said error correcting vectors P and Q by use of predetermined producing equations, to obtain $W_j = M_k(S_1 \oplus T^{i-n-1} \cdot S_2)$ or $W_j = M_k(T^{-Gi} \cdot S_1 \oplus T^{-Hi} \cdot S_2)$;

multiplying circuit means responsive to the column vector S_0 generating from said generating circuit means, for successively multiplying T^{L1}, T^{L2}, . . . , T^{Lm} to transform column vectors $T^{L1} \cdot S_0$, $T^{L2} \cdot S_0$, . . . , $T^{Lm} \cdot S_0$;

operation circuit means responsive to the output of said memory means and said multiplying circuit, for successively performing a mathematical operation described by $M_{kd} \cdot T^{L1} \cdot S_0$, $M_{kd} \cdot T^{L2} \cdot S_0$, . . . , $M_{kd} \cdot T^{Lm} \cdot S_0$, to serially produce vectors having m elements; and

storage circuit means responsive to the serial output of said operation circuit means, for temporarily storing said vectors having m elements which are supplied from said operation circuit means, to perform an m by m linear transformation on said vectors received from said operation circuit means.

4,416,011

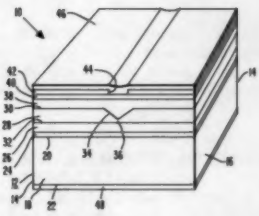
SEMICONDUCTOR LIGHT EMITTING DEVICE

Gregory H. Olsen, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,476

Int. Cl.³ H01S 3/19

U.S. Cl. 372—45 7 Claims



1. A light emitting device comprising:

a semiconductor body having two end faces, at least one of which is partially transmissive of light, a pair of substantially parallel side faces between said end faces, said body comprising:

a substrate;

a first confinement layer overlying a first surface of said substrate and having a flat surface;

an active layer overlying said first confinement layer and having a vee-shaped groove therein extending from a surface thereof towards said flat surface of said first confinement layer and extending between said end faces;

a second confinement layer overlying said active layer and filling said groove;

a first electrically conducting layer overlying at least a portion of the surface of the second confinement layer; and

a second electrically conducting layer overlying a portion of a second surface of the substrate;

the substrate and the first confinement layer are of one conductivity type and the second confinement layer is of the opposite conductivity type and the index of refraction of the active layer at the wavelength of a light beam emitted from the device is greater than that of the first and second confinement layers.

4,416,012

W-GUIDE BURIED HETEROSTRUCTURE LASER

Dan Botez, Mount Holly, and Michael Ettenberg, Freehold, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 323,058

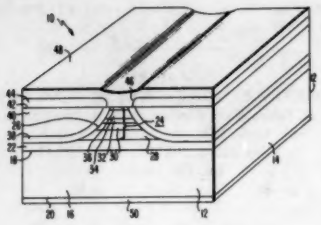
Int. Cl.³ H01S 3/19

U.S. Cl. 372—45 9 Claims

1. In a buried heterostructure laser which emits light at a particular wavelength comprising a substrate having two opposed major surfaces, a mesa having side walls and overlying a portion of said first major surface, a cladding layer overlying the side walls of said mesa and the remainder of said first surface of said substrate, and a burying region overlying said cladding layer wherein said mesa comprises a first confinement layer overlying a portion of said surface of said substrate, an active layer overlying said first confinement layer and a second confinement layer overlying said active layer and wherein

electrical contacts overlie said second confinement layer and a portion of said second major surface of said substrate;

the improvement comprising said cladding layer having a refractive index at said wavelength which is less than the



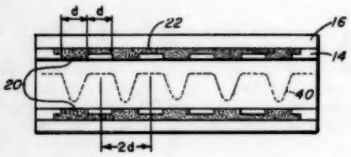
effective refractive index of the fundamental transverse mode in said mesa and wherein the refractive index of said burying region is greater than or equal to the effective refractive index of said mode in said mesa.

4,416,013

DISTRIBUTED FEEDBACK LASER EMPLOYING THE STARK EFFECT

Mary S. Tobin, Tacoma Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 325,623
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—96 **9 Claims**



1. A distributed feedback (DFB) laser comprising:

an amplification medium for amplifying light at the lasing frequency, said amplification medium being of the type which exhibits the Stark effect;

means for pumping said medium to generate a population inversion therein, and

means for producing a spatially varying electric field in said amplification medium of sufficient intensity that an induced Stark effect will produce laser feedback.

4,416,014

COMPOSITE ELECTRODE FOR ARC FURNACE

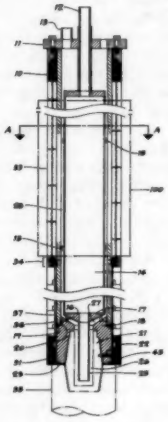
Grady R. Hogg, Jr., Elizabethton, and Nathan S. Tanner, Johnson City, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,829
Int. Cl.³ H05B *7/08*
U.S. Cl. 373—93 **3 Claims**

2. An electrode for an electric arc smelting furnace comprising an upper liquid cooled section, a hollow threaded connecting nipple, and a graphite lower section,

(a) said upper section comprising:

1. a cylindrical main structure formed from metal tubing;
2. its upper end comprising a head plate having a cooling liquid inlet and cooling liquid outlets;
3. said inlet comprising tubing connected to an exterior liquid supply, passing through said head plate, connected to the top plate of a metal internal cylinder concentric with said main structure and occupying a majority of the internal volume of said main structure;
4. said internal cylinder serving as a liquid reservoir, heat sink, and passageway for cooling liquid;
5. said internal cylinder having a bottom plate connected with liquid outlet tubing extending to the interior cavity of said nipple;
6. said liquid inlet, internal cylinder, and outlet tubing forming liquid inflow means for cooling said nipple;
7. said nipple being threaded in place in a metal female socket comprising the lower end of said main structure;
8. a first annulus between said outlet tubing and said nipple communicating with a second annulus between the upper end of said socket and the bottom face of said bottom plate defined by spacers;
9. said second annulus communicating with a third annulus defined by the inside wall of said main structure and the outside wall of said internal cylinder;
10. said third annulus connected with cooling liquid outlets on said upper main top plate;
11. said annuli forming cooling liquid outflow means;



12. the exterior of the electrical contact area comprising the upper portion of said main structure having a cylindrical covering formed from a plurality of rectangle-shaped tiles of graphite of a thickness effective to conduct the electrode current;
13. said tiles having grooves in the edges thereof parallel to the vertical axis of said main structure;
14. said tiles being held in place by vertical T-shaped ribs attached to said main structure having a complementary configuration to said grooves in said tiles;
15. the lower portion of said main structure being insulated with a series of refractory rings having an inside diameter slightly larger than the outside diameter of said main structure, notched at the lower inside radius to match the dimension of a metal retaining ring;
16. the annulus between said refractory rings and said main structure occupied by refractory fiber insulation covered with radiation reflective insulation;

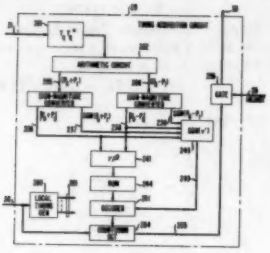
(b) said nipple being hollow, metal, and threaded, defining a cavity having its upper end open and lower end closed;

(c) said lower section being a column comprising one or more graphite electrode sections.

4,416,015
TIMING ACQUISITION IN VOICEBAND DATA SETS

Richard D. Gitlin, Monmouth Beach, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1981, Ser. No. 335,730
Int. Cl.³ H03H *15/00*; H04B *3/19*; H04L *7/02*
U.S. Cl. 375—14 34 Claims



1. A receiver adapted to receive a complex data signal which includes a predetermined timing acquisition signal, said receiver comprising

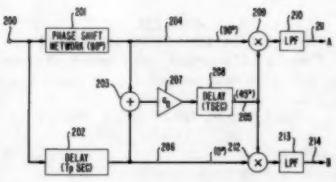
equalizer means including means for forming line samples of said data signal and means for filtering said line samples with a predetermined complex filter characteristic to form a plurality of complex equalizer outputs, said equalizer outputs being optimally free of intersymbol interference when said line samples are formed at optimum sampling points, said sample forming means forming line samples of said timing acquisition signal at sampling points displaced from the optimum sampling points thereof by a time τ and said filtering means forming a plurality of timing acquisition equalizer outputs in response to said timing acquisition signal line samples, and

timing acquisition means for determining the value of τ in response to at least a first timing acquisition envelope sample and for adjusting the phase of said line sample forming means by the value of τ thus determined, each timing acquisition envelope sample being a function of the product of a respective timing acquisition equalizer output with its complex conjugate.

4,416,016
DIFFERENTIAL PHASE SHIFT KEYED RECEIVER

Jeffrey A. Iapicco, Little Ferry, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1981, Ser. No. 272,480
Int. Cl.³ H04L *27/22*
U.S. Cl. 375—85 8 Claims



6. A receiver for demodulating a differential phase shift keyed (DPSK) signal having phase changes every T seconds wherein products are formed between signals of T second differential delay and polarities of said products uniquely determine phase shifts of the DPSK signal, including means for phase shifting the DPSK signal by 90°,

characterized by:

means for additively combining the DPSK signal and the 90° phase shifted signal to form a 45° phase shifted signals;

means for delaying said 45° phase shifted signal by T seconds;

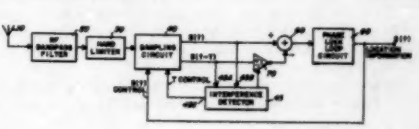
means responsive to said DPSK signal and to said 45° phase shifted signal for forming a first product therebetween; and

means responsive to the 90° phase shifted signal and to the 45° phase shifted signal for forming a second product therebetween.

4,416,017
APPARATUS AND METHOD FOR ATTENUATING INTERFERING SIGNALS

Steven C. Jasper, Schaumburg; Robert V. Jane, Palos Heights; David S. Robins, Buffalo Grove, and Michael H. Retzer, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1981, Ser. No. 222,459
Int. Cl.³ H04B *15/00*
U.S. Cl. 375—99 6 Claims



1. An apparatus for substantially cancelling an undesired signal interfering with a Loran C signal comprising:

receiving means for receiving signals which include a Loran C signal and an undesired interfering signal;

sampling means, coupled to said receiving means, for sampling the pulses of said Loran C Signal at a PTR thereof and for sampling said interfering signals at selected points in time;

autocorrelation function determining means, coupled to said sampling means, for determining a peak of the autocorrelation function of the interfering signal with respect to the PTR samples of the Loran C pulses, said selected points in time being defined to occur substantially at said peak, and

combining means, coupled to said sampling means for combining the samples of said interfering signals with the corresponding samples of said Loran C signals so as to substantially cancel said interfering signal.

4,416,018
DEVICE FOR FORMING IMAGES OF LAYERS OF A THREE-DIMENSIONAL OBJECT BY SUPERPOSITION ZONOGRAMS

Claus P. Curth, Wilhelmshausen; Ulf Tiemens, Prisdorf, and Erhard Klotz, Halstenbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,302
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006828
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—2 12 Claims

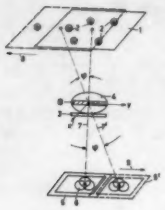
1. A device for imaging layers of a three-dimensional object, said device comprising:

radiation source means arranged on first support means on one side of the object to irradiate the object with penetrating radiation from each of a plurality of source positions, said source positions being distributed in a radiation source plane; and

a record carrier for recording an encoded composite image of the object, said composite image consisting of a plurality of perspective images, said record carrier being arranged on second support means on a side of the object opposite the radiation source means;

characterized in that the radiation source means and the record carrier are each slidably mounted on their respective support means, said radiation source means and record carrier being constrained to slide in opposite directions in parallel slide planes on opposite sides of the stationary object, said sliding motions being further constrained such that every straight line connecting a radiation source position to the center of the record carrier will always pass through one of a set of fixed points in the object for all positions of the radiation source means, each fixed point being associated with one line originating from a radiation source position, said fixed points being in a single plane in the object; and

characterized in that the device further comprises means for sliding the radiation source means and the record carrier.



4,416,019

DEVICE FOR PRODUCING IMAGES OF A LAYER OF AN OBJECT FROM MULTIPLE SHADOW IMAGES WITH VARYING DEGREES OF OVERLAP

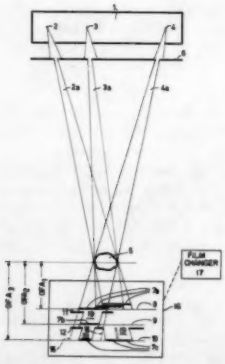
Hermann Weiss, Duvenstedt; Rolf Linde, Haseldorf; Wilfried Mauser, Hamburg, and Erhard Klotz, Halstenbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 196,416, Oct. 14, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,126

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1979, 2941395

Int. Cl.³ G03B 41/16

U.S. Cl. 378—2 **18 Claims**



1. A device for producing images of a layer of a three-dimentional object comprising a plurality of radiation sources arranged in a radiation source plane for irradiating the object with beams of penetrating rays from different directions to generate a plurality of shadow images and a plurality of planar recording layers, arranged parallel to one another at exposure positions, for recording all shadow images thereby generated, characterized in that the device further comprises a plurality of diaphragm means which define apertures disposed between each recording layer and the source plane for masking the beams of rays, wherein the apertures decrease in size as a function of the distance between the associated diaphragm means and the radiation sources.

4,416,020

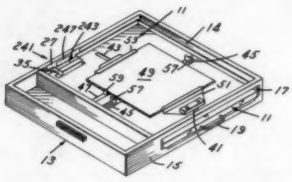
SIZE SENSING X-RAY CASSETTE TRAY FOR X-RAY EQUIPMENT

James C. Wagner, Ft. Thomas; James E. Barnard, Sparta, both of Ky., and Robert J. Woerner, Cincinnati, Ohio, assignors to Material Control, Inc., Aurora, Ill.

Filed Nov. 4, 1981, Ser. No. 318,086

Int. Cl.³ G03B 41/16

U.S. Cl. 378—181 **22 Claims**



1. A size sensing X-ray cassette tray adapted for selective nesting within horizontal X-ray tables or vertical holders comprising longitudinally spaced opposed front and rear cassette engaging clamps slidably mounted upon said tray longitudinally thereof, for centering and holding a cassette upon said tray;

link means on said tray interconnecting said clamps for movement in unison towards and away from each other;

an elongated first linear potentiometer upon said tray adjacent one of said clamps and parallel to its direction of movement, having leads connected into an electrical circuit;

a wiper arm connected to said one of said clamps having contacts slidably engageable with said first potentiometer;

a side sensing finger slidably mounted upon said tray for movement at right angles to said clamp movements engageable with one side of said cassette;

an elongated second linear potentiometer upon said tray adjacent said side sensing finger and parallel to its direction of movement, having leads connected into said electrical circuit;

and a wiper arm connected to said finger having contacts slidably engageable with said second potentiometer, the positioning of said contacts upon said potentiometers establishing electrical potentials in said circuit proportional to the length and width of said cassette, respectively.

4,416,021

X-RAY EXAMINATION APPARATUS

Steven J. Plummer, Middlefield, and James E. Wieloch, Southington, both of Conn., assignors to Siemens Corporation, Iselin, N.J.

Filed Feb. 18, 1982, Ser. No. 349,761

Int. Cl.³ G03B 41/16

U.S. Cl. 378—181 **8 Claims**

1. In an X-ray apparatus containing:

an X-ray tube;

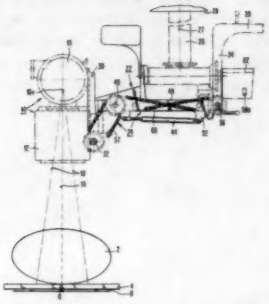
a support for said tube; means for moving said X-ray tube between

a first position in which said X-ray tube is adapted to emit a beam of X-rays in a first direction, and

a second position in which said X-ray tube is adapted to emit a beam of X-rays in a second direction substantially normal to said first direction;

a film cassette tray having a plane in an exposure position to receive said beam of X-rays from said X-ray tube when said X-ray tube is in its second position; and

sprocket and chain means operationally connected to said X-ray tube support for positioning said film cassette tray



in a waiting position outside said beam of X-rays when said X-ray tube is in its first position and for transferring said film cassette tray from said waiting position to said exposure position when said X-ray tube is moved from its first position to its second position.

4,416,022

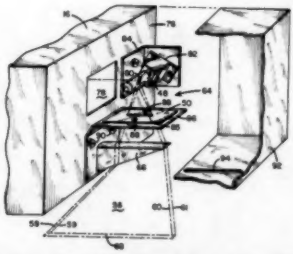
PRISM LIGHT-LINE SYSTEM

James W. Cutter, Hollister, Calif., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Mar. 29, 1982, Ser. No. 362,807

Int. Cl.³ A61B 6/08

U.S. Cl. 378—206 **12 Claims**



1. A light-line system for visual alignment of an X-ray source with an object to receive X-rays preparatory to radiography comprising:

a source of visible light;

a visible light aperture means having a slit-type aperture therein for transmitting a beam of light therethrough; and

visible light collimating means receiving and collimating said beam of visible light by directing said beam within a central plane such that two sides of said beam are substantially parallel to said central plane to produce a narrow width light-line having a useful length greatly in excess of said width.

4,416,023

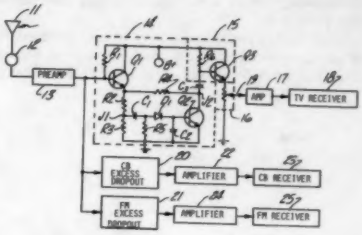
STRONG AND WEAK SIGNAL PREAMPLIFICATION SYSTEM

John C. Michoff, 8999 Field Rd., Algonac, Mich. 48001

Filed Jan. 17, 1980, Ser. No. 112,944

Int. Cl.³ H04B 1/16

U.S. Cl. 455—291 **20 Claims**



1. A preamplifier connectable between an antenna producing an output signal in response to signals received from local and distant transmitting stations and an input to a receiver capable of producing an undistorted output in response to receiving input signals between predetermined input signal levels of said receiver, said preamplifier comprising:

preamplification means for amplifying the level of said output signal of the antenna in response to the signals received from said local and distant transmitting stations to generate an amplified signal;

signal level responsive means responsive to the amplitude of said amplified signal for limiting the amplitude of said amplified signal to less than a predetermined maximum amplitude to generate a limited signal; and

signal attenuator means for attenuating the amplitude of said limited signal to generate an input signal for said receiver having a signal level within the predetermined input signal levels of said receiver.

4,416,024

DISTORTION REDUCING CIRCUIT IN FM RECEIVER

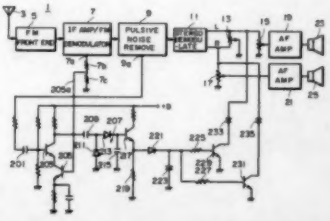
Takenori Ugari, Hirakata, and Yoichi Yano, Higashiosaka, both of Japan, assignors to Sanyo Electric Co., Inc., Moriguchi, Japan

Filed Nov. 26, 1980, Ser. No. 210,378

Claims priority, application Japan, Dec. 17, 1979, 54-164297; Dec. 21, 1979, 54-167027; Dec. 27, 1979, 54-182738[U]; Oct. 14, 1980, 55-146691[U]

Int. Cl.³ H04B 1/10

U.S. Cl. 455—303 **21 Claims**



1. A distortion reducing circuit in an FM receiver, said FM receiver comprising:

front end means for receiving an FM signal containing information corresponding to a range of frequencies and providing an intermediate frequency output signal;

circuit means for receiving and deomodulating said interme-

diate frequency output signal to produce a demodulating signal which includes a component corresponding to distortion in the FM signal received by said front end means;

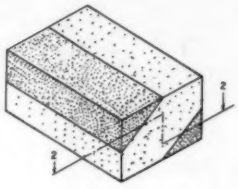
utilization means responsive to said demodulated signal for reproducing information contained in said FM signal;

means responsive to the demodulated output signal of said demodulating circuit means for detecting said distortion component; and

distortion reducing means responsive to said detected distortion component of said distortion detecting means for reducing a high frequency component of the range of frequencies included in said demodulated output signal which is applied to said utilization means while permitting relatively unaffected passage of a low frequency component of a range of frequencies included in said demodulated output signal to said utilization means,

said distortion reducing means being rapidly responsive to cause reduction upon the received FM signal going from a state of no distortion to one with distortion and less rapidly responsive upon the FM signal going from a state with distortion to one without distortion.

271,344
TWO COLOR CHEWING GUM
Steven M. Faust, Massapequa, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Dec. 12, 1980, Ser. No. 215,983
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—12



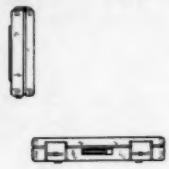
271,345
VEST OR SIMILAR ARTICLE
John E. Banks, 2598 Dixon Dr., Santa Clara, Calif. 95051
Filed Mar. 23, 1981, Ser. No. 246,378
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—184

271,346
HELMET
Paul R. Hein, 10445 Canoga Ave., Apt. #114, Chatsworth, Calif. 91311
Filed Jul. 30, 1981, Ser. No. 288,668
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—231

271,347
HELMET
Rene Bourque, Duvernay, Canada, assignor to Gamebridge Inc., St. Jerome, Canada
Filed Mar. 8, 1982, Ser. No. 355,386
Claims priority, application Canada, Jan. 29, 1982, 29-01-82-10
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—232

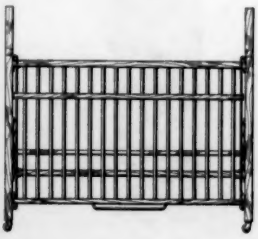
271,348
SOCK
James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677
Filed May 13, 1981, Ser. No. 263,114
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—331

271,349
CASE FOR A VIDEO CASSETTE
Hartmut Thiele, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Bayerwerk-Leverkusen, Fed. Rep. of Germany
Filed Sep. 24, 1981, Ser. No. 305,145
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



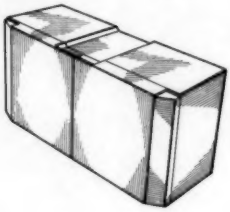
271,350
COMBINED KEY HOLDER AND COIN PURSE
Thomas R. Robbins, 1919 Heliotrope, Santa Ana, Calif. 92705
Filed Dec. 21, 1981, Ser. No. 333,047
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—62

271,351
CRIB
Henry W. Mower, Stevens Point, Wis.; Allen Seymour, Clayton, Ohio; Jerome P. Koziatek, Hinckley, Ohio, and Joseph G. Lendvay, Ravenna, Ohio, assignors to Questor Corporation, Tampa, Fla.
Filed Sep. 14, 1981, Ser. No. 302,307
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—16



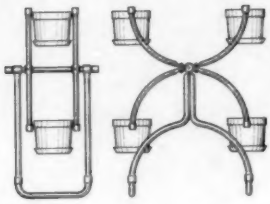
271,352
STOOL
Peter De Boer, Amsterdam, Netherlands, assignor to Gispen and Staalmeubel B.V., Stationssingel, Netherlands
Filed Oct. 2, 1981, Ser. No. 308,030
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—29

271,353
BATHROOM CABINET
Zeev Raz, 17 Keren Hayessod St., Beersheva, Israel
Filed Sep. 5, 1980, Ser. No. 184,260
Term of patent 14 years
Int. Cl. D6—*04;* D23—*02*
U.S. Cl. D6—104

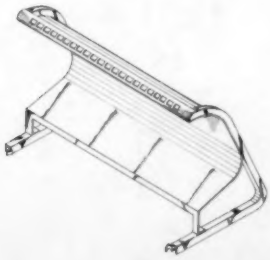


271,354
TABLE
Ralph Lerner, 9 Ericsson St., Belmont, Mass. 02178, and Mark Cigolle, 94 Mercer St., New York, N.Y. 10012
Filed Oct. 26, 1981, Ser. No. 315,170
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

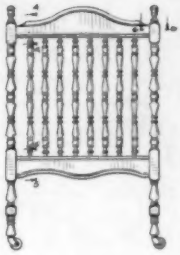
271,355
ROTATABLE PLANTER
Frank Altman, 1615 S. 14th Ave., Hollywood, Fla. 33020
Filed Jun. 1, 1981, Ser. No. 269,275
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—183



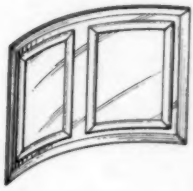
271,356
MAGNETIC TAPE REEL STORAGE RACK
Helmut H. Henneberg, Canton, and John F. Graham, Sudbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed Mar. 16, 1981, Ser. No. 244,502
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



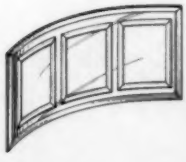
271,357
CRIB FOOTBOARD
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Aug. 7, 1981, Ser. No. 290,992
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198



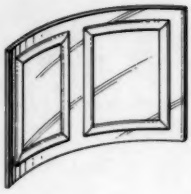
271,358
PICTURE FRAME
Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331
Filed Mar. 22, 1982, Ser. No. 360,329
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



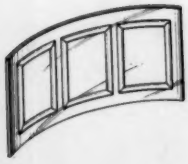
271,359
PICTURE FRAME
Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331
Filed Mar. 22, 1982, Ser. No. 360,330
Term of patent 14 years
Int. Cl. D6—*07*
U S. Cl. D6—234



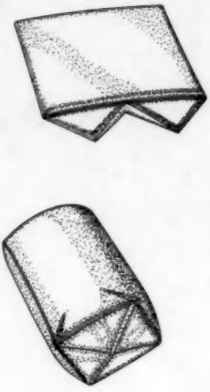
271,360
PICTURE FRAME
Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331
Filed Mar. 22, 1982, Ser. No. 360,331
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



271,361
PICTURE FRAME
Walter Le, 10340 Glenoaks Blvd., Pacoima, Calif. 91331
Filed Mar. 22, 1982, Ser. No. 360,594
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

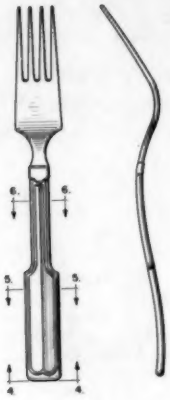


271,362
COLLAPSIBLE INSULATING CONTAINER
David I. Heweston, 163 Crown St., East Sydney, New South Wales, 2010, Australia
Filed Apr. 20, 1981, Ser. No. 255,534
Claims priority, application Australia, Oct. 24, 1980, 82,429
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—70



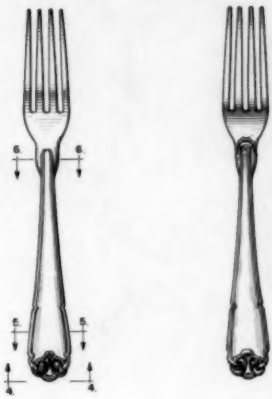
271,363
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,552
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

271,364
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,606
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

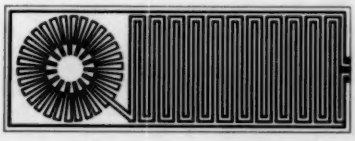


271,365
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,610
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

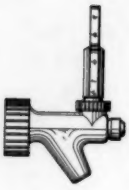
271,366
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,613
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137



271,367
ELECTRIC HEATING PLATE FOR A FOOD WARMER
Malcolm A. Goldsworthy, Whorlton, England, assignor to Schott Industrial Glass Limited, Newton Aycliffe, England
Filed May 28, 1981, Ser. No. 270,307
Claims priority, application United Kingdom, Apr. 21, 1981, 997806
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—363

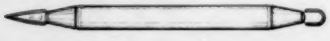


271,368
BEVERAGE DISPENSING VALVE
Terrance G. Belland, Maple Grove; William B. MacKrell, New Brighton, and Walter E. Ranua, Blaine, all of Minn., assignors to The Cornelius Company, Anoka, Minn.
Filed Feb. 5, 1982, Ser. No. 345,980
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—398

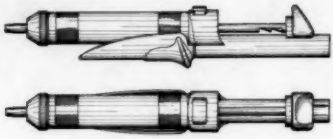


271,369
SNOW SCOOP
John E. Gesner, Meriden, Conn., assignor to JEG, Inc., Meriden, Conn.
Filed Jul. 6, 1982, Ser. No. 395,669
Term of patent 14 years
Int. Cl. D08—*01*
U.S. Cl. D8—10

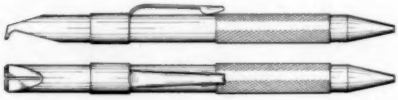
271,370
CERAMIC CLEAN-UP TRIM TOOL
Louis San Antonio, 114 Smithfield Ave., Pawtucket, R.I. 02860
Filed May 26, 1981, Ser. No. 267,432
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—14



271,371
SOLDER REMOVING TOOL OR THE LIKE
William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265
Filed Jan. 8, 1981, Ser. No. 223,499
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

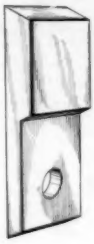


271,372
PIN STRAIGHTENING AND PRYING TOOL OR THE LIKE
William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265
Filed Jan. 8, 1981, Ser. No. 223,500
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88

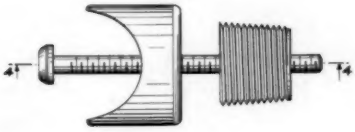


271,373
COMBINED LIGHT DIMMER KNOB AND ESCUTCHEON THEREFOR
Joel S. Spira, Coopersburg, and Noel Mayo, Philadelphia, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Feb. 20, 1981, Ser. No. 236,274
Term of patent 14 years
Int. Cl. D8—*06, 09;* D13—*03*
U.S. Cl. D8—302

271,374
KNOB ESCUTCHEON
Lawrence D. Butts, Charlotte, N.C., assignor to Scovill Inc., Waterbury, Conn.
Filed Oct. 5, 1981, Ser. No. 308,819
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—353



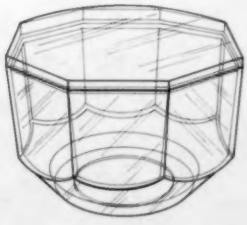
271,375
COUPLER FOR STRUCTURAL TUBES OR THE LIKE
Terrance A. Baroody, 2127 Foxwood Dr., Orange Park, Fla. 32073
Filed Jun. 18, 1981, Ser. No. 275,133
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



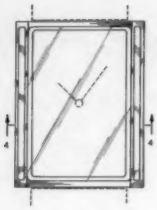
271,376
COUPLER SADDLE FOR STRUCTURAL TUBES OR THE LIKE
Terrance A. Baroody, 2127 Foxwood Dr., Orange Park, Fla. 32073
Filed Jun. 18, 1981, Ser. No. 275,140
Term of patent 14 years
Int. Cl. D8—*081*
U.S. Cl. D8—382

271,377
BOTTLE
Matthew J. Klim, New Hartford, Conn., assignor to C.V.B.G., Bordeaux, France
Filed Mar. 4, 1981, Ser. No. 240,292
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378

271,378
TRANSPARENT BOX
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Jul. 6, 1981, Ser. No. 280,875
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424

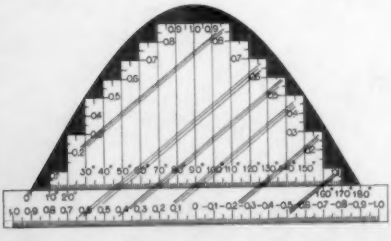


271,379
WATCHCASE
Jean G. Malamoud, Saint-Jorioz, France, assignor to S. T. Dupont, Paris, France
Filed Jun. 16, 1980, Ser. No. 159,896
Claims priority, application France, Mar. 31, 1980, 80 1023
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

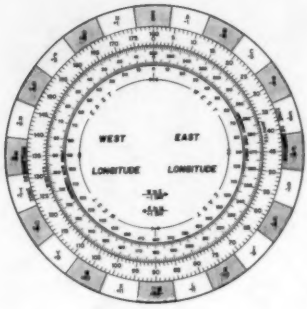


271,380
ELECTRONIC THERMOSTAT INDICATOR OR SIMILAR ARTICLE
Pietro Zanazzo, Novara; Guiliano Mainardi, Bellusco, and Rodolfo Giorgetti, Milan, all of Italy, assignors to ERO Electronic s.r.l., Milan, Italy
Filed May 26, 1981, Ser. No. 267,026
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—49

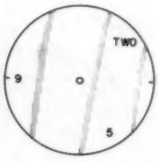
271,381
SINE TEMPLATE
Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405
Filed May 22, 1981, Ser. No. 266,502
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



271,382
CIRCULAR NAVIGATIONAL RULE AID
Jerome E. Stein, P.O. Box 6314, San Diego, Calif. 92106
Filed Sep. 11, 1981, Ser. No. 301,194
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65



271,383
WATCH FACE
Luke P. Cuccio, 511 Puddingstone Dr., San Dimas, Calif. 91773
Filed Jul. 27, 1981, Ser. No. 287,196
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



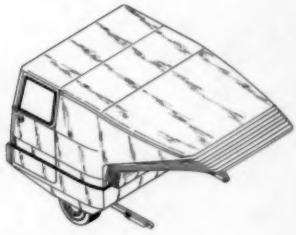
271,384
PENDANT OR THE LIKE
Jessie L. D. Frye, Meadowbrook Mobile Home Park, Rte. #19, Lot #5, Johnson City, Tenn. 37601
Filed Oct. 30, 1981, Ser. No. 316,833
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—76

271,385
SCULPTURE OR THE LIKE
Gyora Novak, One W. 72nd St., New York, N.Y. 10023
Filed Oct. 16, 1980, Ser. No. 197,419
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

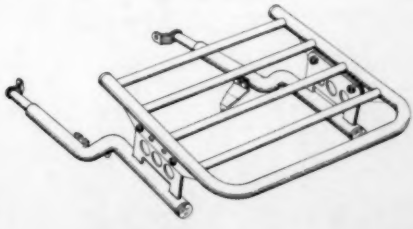
271,386
WALL HANGING
Amelia A. Sharp, 337 Sunrise Ct., Benicia, Calif. 94510
Filed Jun. 24, 1982, Ser. No. 391,526
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—133

271,387
MINIATURE GREENHOUSE
William L. Lentz, Chattanooga, Tenn.; Richard A. Siegel, Monroe, and Colin Healy, Stratford, both of Conn., assignors to DeSoto, Inc., Des Plaines, Ill.
Filed Nov. 2, 1981, Ser. No. 317,247
Term of patent 14 years
Int. Cl. D11—*02*; D6—*04*; D30—*02*
U.S. Cl. D11—145

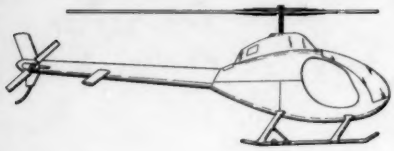
271,388
CAMPING TRAILER
Robert E. Bourke, Westport, Conn., assignor to NBS Incorporated, Lakeview, Ohio
Filed Feb. 6, 1981, Ser. No. 232,019
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—104



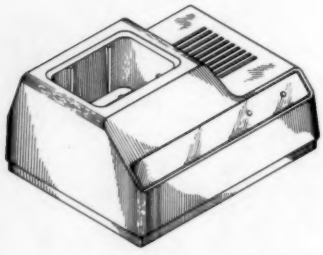
271,389
LUGGAGE CARRIER
Mark Turkington, and Philip Turkington, both of Willimantic, Conn., assignors to Connecticut Cycle Accessories, Inc., Willimantic, Conn.
Filed Jul. 20, 1981, Ser. No. 285,150
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



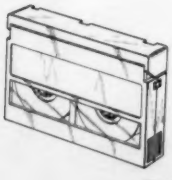
271,390
HELICOPTER
Buford J. Schramm, 1330 E. Fremont Dr., Tempe, Ariz. 85281
Filed Apr. 28, 1980, Ser. No. 146,621
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—327



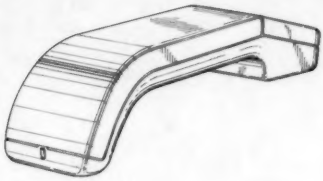
271,391
BATTERY CHARGING UNIT FOR A PORTABLE RADIO OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 1, 1981, Ser. No. 269,144
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—5



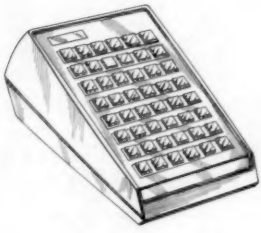
271,392
CASSETTE FOR VIDEO TAPE RECORDER
Hidemichi Sumisha, Kadoma, and Seikou Minamide, Nara, both of Japan, assignors to Matsushita Electric Industrial Co, Ltd., Osaka, Japan
Filed Jul. 29, 1981, Ser. No. 287,976
Claims priority, application Japan, Jan. 30, 1981, 56-3440
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11



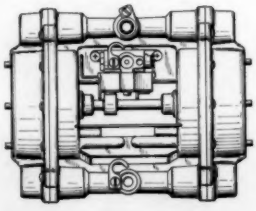
271,393
TELEPHONE HANDSET
Peter B. Carr, Harpenden, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Mar. 2, 1981, Ser. No. 239,735
Claims priority, application United Kingdom, Aug. 28, 1980, 996341
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—63



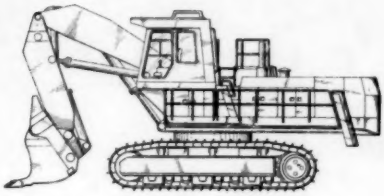
271,394
DIRECT STATION SELECTION CONSOLE
Wilbert C. Brown, Fairfield, and Roman F. Pomponi, Norwalk, both of Conn., assignors to TIE/communications, Inc., Shelton, Conn.
Filed Jan. 21, 1980, Ser. No. 113,998
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66



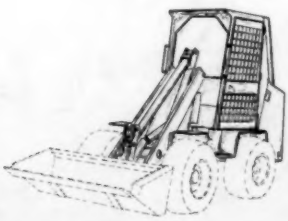
271,395
PUMP
William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Nov. 12, 1981, Ser. No. 320,585
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



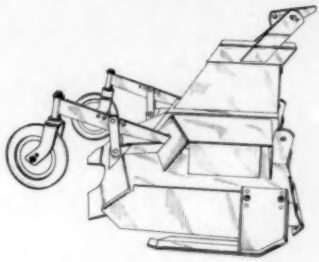
271,396
LOADING SHOVEL
Takayasu Inui, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jun. 23, 1981, Ser. No. 276,664
Claims priority, application Japan, Jan. 23, 1981, 56-1857
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—24



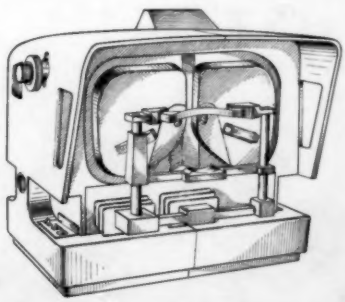
271,397
ARTICULATED LOADER VEHICLE BODY
Patrick Kuhn; Thomas M. Sagaser, and Oryn B. Wagner, all of Bismarck, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.
Filed May 28, 1981, Ser. No. 268,041
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—25



271,398
REAR MOUNTED MOWER FOR TRACTORS
James E. McCanse, Ogle County; George E. Draege, Oregon, both of Ill.; Richard J. Robbins, Derby, Kans.; Timothy A. Sevick, Oregon, Ill., and Richard E. Ten Eyck, Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed Apr. 21, 1980, Ser. No. 142,438
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27



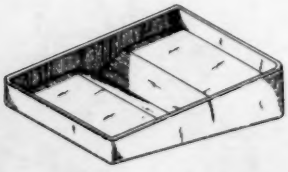
271,399
OPHTHALMIC INSTRUMENT
Paul A. Jordan, Oneida, and Edwin A. Speaker, Brockport, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Oct. 26, 1981, Ser. No. 314,599
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—130



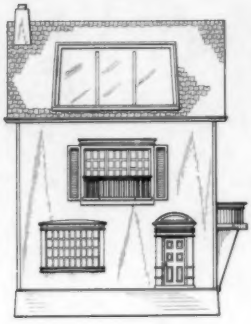
271,400
VIOLIN
Chester Knighten, P.O. Box 62, Foreman, Ark. 71830
Filed Jul. 10, 1981, Ser. No. 282,009
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—17

271,401
DRUMSTICK
Bruce N. Hardy, Elkhart, Ind., assignor to Silver Street Incorporated, Elkhart, Ind.
Filed Aug. 3, 1981, Ser. No. 289,291
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

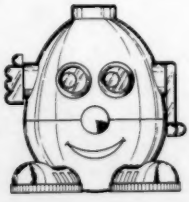
271,402
NOTE PAPER RETRIEVAL TRAY
Jerry L. Sharber, 2334 Middlesex Dr., Toledo, Ohio 43606
Filed Jun. 8, 1981, Ser. No. 271,708
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



271,403
TOY DOLL HOUSE
Richard W. M. Kimbrough, Lancaster, Pa., and Craig J. McElhaney, West Falls, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Mar. 24, 1981, Ser. No. 247,203
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114



271,404
TOY FIGURE
Helen C. Chan, Kowloon, Hong Kong, assignor to Alfred Eli Simmons and Kui-Yan Lung, both of Kowloon, Hong Kong
Filed Oct. 28, 1981, Ser. No. 315,900
Claims priority, application United Kingdom, Jul. 3, 1981, 1001309
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

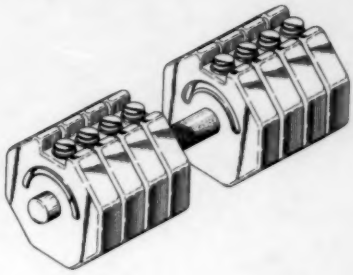


271,405
DOLL
Charles H. Helein, 11752 Dry River Ct., Reston, Va. 22090
Filed Jan. 27, 1982, Ser. No. 343,103
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

271,406
TOY BUTTERFLY
Thomas P. Osborne, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed Oct. 19, 1981, Ser. No. 312,567
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—185

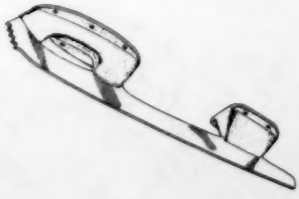
271,407
DUMBBELL
Forrest S. Wright, 533 Hill, Rochester, Mich. 48063
Filed Dec. 11, 1981, Ser. No. 329,638
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—197

271,408
BARBELL
Robert J. Bauer, 3138 Chapel Down Dr., Dallas, Tex. 75229
Filed Dec. 14, 1981, Ser. No. 330,224
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—197



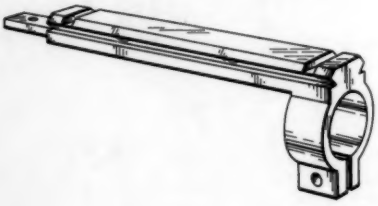
271,409
GAME PROJECTILE
Daniel Lukach, Rochester, N.Y., assignor to Ideas Materialized, Inc., Rochester, N.Y.
Filed Oct. 27, 1980, Ser. No. 201,200
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—207

271,410
FIGURE SKATE BLADE
Icaro Olivieri, Montebelluna, Italy, assignor to Warrington Inc., Canada
Filed Nov. 21, 1980, Ser. No. 209,285
Claims priority, application Canada, May 21, 1980, 21-05-80-3
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225



271,411
MINIATURE BOW
Glenn H. Adkins, Whittier, Calif., assignor to Minibow, Inc., Whittier, Calif.
Filed Oct. 19, 1981, Ser. No. 312,859
Term of patent 14 years
Int. Cl. D21—*02*; D22—*02*
U.S. Cl. D22—5

271,412
TELESCOPIC SIGHT MOUNT FOR PISTOL
Paul D. Long, 1606 Bristol, Kansas City, Mo. 64126
Filed Oct. 26, 1981, Ser. No. 315,000
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

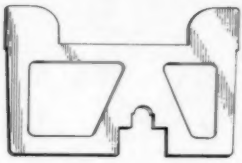


271,413
BELT ATTACHED FISHING ROD HOLDER
Thomas Munroe, P.O. Box 538, Far Hills Station, Dayton, Ohio 45419
Filed Mar. 4, 1983, Ser. No. 472,406
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—14

271,414
COUNTING SWATTER
Frederick H. Kroll, 72 Wood Hollow La., New Rochelle, N.Y. 10804
Filed Oct. 26, 1981, Ser. No. 314,880
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—20

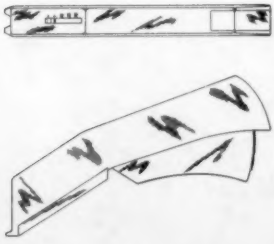
271,415
FISH LURE
Thurman H. Mumma, 10510 Brosius Rd., Garrettsville, Ohio 44231
Filed Nov. 19, 1981, Ser. No. 322,778
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

271,416
FILTER CARTRIDGE FRAME
Gerald J. Mayer, 4027 Folkstone Dr., Toledo, Ohio 43614
Filed Mar. 16, 1981, Ser. No. 244,040
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



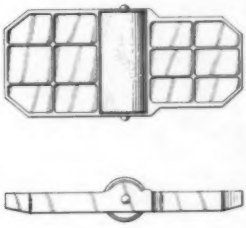
271,417
COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE
Rud Thygesen, Rungsted Kyst, and Johnny Sorensen, Elsinore, both of Denmark, assignors to Dansk Pressalit A/S, Arhus, Denmark
Filed Jul. 22, 1981, Ser. No. 285,709
Claims priority, application Denmark, Feb. 9, 1981, 193/1981
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

271,418
SURGICAL STAPLING INSTRUMENT
Jay E. Campbell, Upper Black Eddy; Richard H. Reichmann, Churchville, both of Pa., and Lehmann K. Li, Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed May 27, 1980, Ser. No. 153,227
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

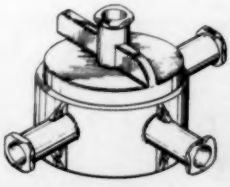


271,419
MONOPOLAR ELECTROSURGICAL DEVICE WITH DUAL 360° HAND SWITCH
Patrick E. Hoff, Boulder, Colo., assignor to Technology Applications Group, Inc., Boulder, Colo.
Filed Apr. 6, 1979, Ser. No. 27,764
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28

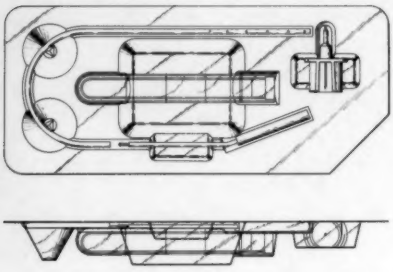
271,420
FOOT MASSAGER AND LEG EXERCISER
Oscar A. Sierra, 238 Moonstone, San Antonio, Tex. 78233
Filed May 26, 1981, Ser. No. 266,889
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36



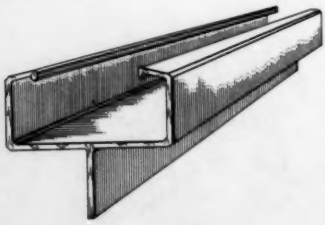
271,421
MEDICAL VALVE
James W. Fetterman, 445 Franklin St., Apt. 24, Athens, Ga. 30601
Filed Jun. 12, 1981, Ser. No. 272,898
Term of patent 14 years
Int. Cl. D24—*99*; D23—*01*
U.S. Cl. D24—53



271,422
KIT FOR A WOUND DRAINAGE SYSTEM
Thomas L. Breland, Atlanta, Ga., assignor to Glasrock Products, Inc., Fairburn, Ga.
Filed Jul. 11, 1980, Ser. No. 167,693
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56

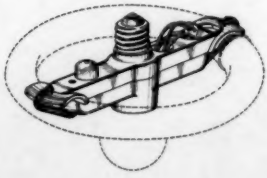


271,423
BEAM
Björn K. Sundeby, Höåsvägen 16, Moheda, Sweden (S-340 36), and Per A. Ljungberg, Borgmästaregatan 2, Växjö, Sweden
Filed Sep. 9, 1981, Ser. No. 300,524
Claims priority, application Sweden, Mar. 11, 1981, 81-0619
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77



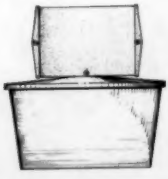
271,424
COMPACT FLUORESCENT LAMP UNIT
Robert G. Young, Nutley; Edward W. Morton, Teaneck; Henry Skwirut, Verona, and Thomas E. Dooley, Clifton, all of N.J., assignors to North American Philips Electric Corp., New York, N.Y.
Filed Nov. 13, 1980, Ser. No. 206,501
Term of patent 14 years
Int. Cl. D26—*05, 04*
U.S. Cl. D26—26

271,425
COMBINED FLUORESCENT AND INCANDESCENT LAMP ADAPTER
Hideo Moriyama, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 4, 1981, Ser. No. 289,923
Claims priority, application Japan, Feb. 27, 1981, 56-7918
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—26

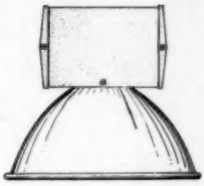


271,426
FOG LIGHT
Hisao Yabata, Tamamura, Japan, assignor to Ichikawa Press Industry Co., Ltd., Takasaki, Japan
Filed Aug. 27, 1981, Ser. No. 296,926
Claims priority, application Japan, May 27, 1981, 56-22634
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—29

271,427
LIGHTING FIXTURE
Hendrik A. J. de Vos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Aug. 19, 1981, Ser. No. 294,255
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—85



271,428
LIGHTING FIXTURE
Hendrik A. J. de Vos; Elzear R. Labouliere, both of Swansea, Mass., and Gary M. Altman, Salem, N.H., assignors to GTE Products Corporation, Stamford, Conn.
Filed Aug. 19, 1981, Ser. No. 294,256
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—85

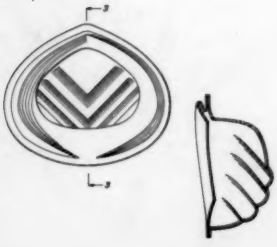


271,429
LAMP
Freddie J. Andersen, Copenhagen, Denmark, assignor to Woodchuck of Halton Hills Inc., Acton, Canada
Filed Nov. 30, 1981, Ser. No. 325,632
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—104

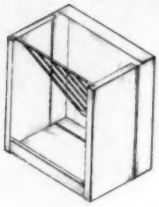
271,430
BLOW DRYER
Frank Antonacci, 276 Indian Trail, Mountainside, N.J. 07092, and Ronald Carluccio, 242 Washington St., Berkeley Heights, N.J. 07922
Filed Oct. 5, 1981, Ser. No. 308,523
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

271,431
DENTAL FLOSS CONTAINER
Barry G. Seelig, Tuxedo Park, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 20, 1979, Ser. No. 68,252
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D28—64

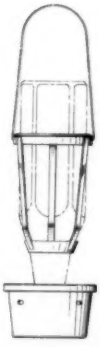
271,432
DUST FILTERING RESPIRATOR
Sheng-Chung Liao, Murrysville, and John W. Neidhart, Monroeville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Jun. 24, 1981, Ser. No. 277,062
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D29—7



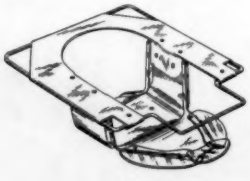
271,433
FOLDABLE LIVESTOCK FEEDER
Jackie D. Holland, 4831 Peakview, Erie, Colo. 80516
Filed Jan. 8, 1981, Ser. No. 223,251
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



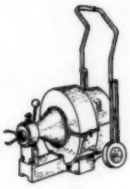
271,434
BIRD FEEDER
Hugh E. Love, 2931 Birch Pl., Fullerton, Calif. 92635
Filed Dec. 28, 1981, Ser. No. 335,073
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



271,435
TOILET ADAPTER FOR PET ANIMALS
Jan G. L. S. Kullenbäck, P.O. Box 6011, 400 60 Göteborg 6, Sweden
Filed Jan. 14, 1981, Ser. No. 224,935
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

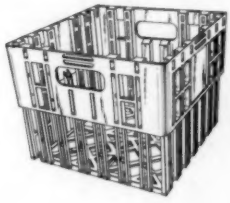


271,436
SEWER CLEANING MACHINE
Larry F. Babb, LaGrange; Walter J. Noveske, Elyria; Arthur J. Pulos, Fayetteville, all of Ohio, and Paul B. Sweeney, Syracuse, N.Y., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Jun. 26, 1981, Ser. No. 277,883
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—14



271,437
LAUNDRY ROOM CLOTHES HANGER
Richard E. Thiot, 4981 Cedar Bay St., Orlando, Fla. 32808
Filed Sep. 4, 1981, Ser. No. 299,566
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—58

271,438
BOX
Daniel R. Miller, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio
Filed Apr. 17, 1981, Ser. No. 255,341
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—43



REEXAMINATIONS

NOVEMBER 15, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,962,136 (134th)

CATALYST FOR PRODUCTION OF ETHYLENE OXIDE

Robert P. Nielsen, Houston, Tex., and John H. La Rochelle, Baton Rouge, La., assignors to Shell Oil Company, Houston, Tex.

Reexamination Request No. 90/000,275, Oct. 18, 1982.
Reexamination Certificate for Patent No. 3,962,136, issued Jun. 8, 1976, Ser. No. 621,270, Oct. 10, 1975.
Continuation-in-part of Ser. No. 471,398, May 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,349, Dec. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 216,188, Jan. 7, 1972, abandoned.
Int. Cl.[3] **B01J** *21/04, 21/08, 23/04, 23/50*
U.S. Cl. 252—454

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **9** and **10**, having been finally determined to be unpatentable, are cancelled.

Claims **1–4**, **11**, **18**, **20**, and **22–25** are determined to be patentable as amended:

Claims **5–8**, **12–17**, **19**, **21**, **26**, and **27** dependent on amended claims, are determined to be patentable.

1. A catalyst article *for production of ethylene oxide* comprising: a porous refractory support having deposited on its exterior and pore surfaces from about 2% by weight to about 20% by weight of silver and, coincidentally deposited with silver, a total of from about 4.0×10^{-5} grew per kilogram of total catalyst to about 8.0×10^{-3} grew per kilogram of total catalyst of *higher* alkali metal present in final form on the support in the form of an oxide in which the said oxide consists of an oxide of cesium, or rubidium, or mixtures thereof optionally combined with a minor proportion of the oxide of potassium relative to said rubidium and cesium, *the combination of silver and an alkali metal oxide on the support affording higher ethylene oxidation selectivities to ethylene oxide at a given ethylene conversion in the partial oxidation of ethylene to ethylene oxide than is obtained with the same combination of silver and support not containing said higher alkali metal*.

B1 4,174,332 (135th)

SELF-CROSSLINKING RESIN EMULSIONS FOR CATHODICALLY DEPOSITABLE COATING COMPOSITIONS

Helmut Hönig, and Georgios Pampouchidis, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Reexamination Request No. 90/000,260, Sep. 29, 1982.
Reexamination Certificate for Patent No. 4,174,332, issued Nov. 13, 1979, Ser. No. 874,565, Feb. 2, 1978.
Claims priority, application Austria, Feb. 7, 1977, 758/77; Dec. 15, 1977, 8955/77
Int. Cl.[3] **C08L** *63/00*
U.S. Cl. 523—404

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **7** are determined to be patentable as amended:

Claims **2–6**, **8**, and **9**, dependent on amended claims, are determined to be patentable.

New claims **10–19** are added and determined to be patentable.

1. Emulsions of binders which are cathodically depositable in an electrodeposition system comprising (A) 98 to 50 percent by weight of a water-soluble self-crosslinking cationic resin water-dilutable upon partial or total neutralization with an inorganic or organic acid, said resin containing on an average at least 0.5 basic nitrogen atoms in 1000 molecular weight units and a double bond number of at least 0.5; and (B) 2 to 50 percent by weight of a water-insoluble self-crosslinking polymeric resin having a double bond number of at least 0.8, *said double bond number being the number of chain end and side chain double bonds in 1000 molecular weight units.*

B1 4,358,573 (136th)

WAXY MALEIC ANHYDRIDE ALPHA OLEFIN TERPOLYMERS

Calvin J. Verbrugge, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Reexamination Request No. 90/000,361, Apr. 21, 1983.
Reexamination Certificate for Patent No. 4,358,573, issued Nov. 9, 1982, Ser. No. 268,432, May 29, 1981.
Int. Cl.[3] **C08F** *220/08*
U.S. Cl. 526—272

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **6** having been finally determined to be unpatentable, is cancelled.

Claim **1** is determined to be patentable as amended:

Claims **2–5** and **7**, dependent on amended claims, are determined to be patentable.

New claims **8–14** are added and determined to be patentable.

1. A terpolymer of from about 49–60 mole percent maleic anhydride, from about 10–40 mole percent of at least *a lower* 1-alkene, having from 4–16 carbon atoms, and from about 40–10 mole percent of at least *a higher* 1-alkene, having at least **[18]** *30* carbon atoms.

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Betong AB: *See*—
Thim, Stig, 4,415,120., Cl. 238-8.000.
A. F. Trenchers Limited: *See*—
Fulford, Dennis R., 4,415,053., Cl. 180-74.000.
Abbott Laboratories: *See*—
Haas, Tommy B., 4,415,098., Cl. 221-202.000.
Abe, Yoshikazu: *See*—
Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, 4,415,308., Cl. 415-72.000.
Ace Orthopedic Manufacturing, Inc.: *See*—
Stednitz, Denis P., 4,414,966., Cl. 128-92.00B.
Ackeret, Peter, to Licinvest AG. Holder for photographic prints. 4,415,079., Cl. 206-45.340.
Ackerman, Richard C.; Jewer, Alan A.; and Hurlbut, Donovan W., to News Log International, Inc. Method and apparatus for optically reading digital data inscribed in an arcuate pattern on a data carrier. 4,416,001., Cl. 369-44.000.
Adcock, Gerald L. Downhole case driving apparatus for impact drills. 4,415,047., Cl. 175-305.000.
Adcock, Ralph L., to Sperry Corporation. Dual port memory interlock. 4,415,972., Cl. 364-200.000.
ADEC, Inc.: *See*—
Allgood, Marvin D., 4,415,896., Cl. 340-870.030.
Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,415,688., Cl. 524-102.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,415,689., Cl. 524-103.000.
Adkins, Charles M., III: *See*—
Wilsdorf, Doris; Wilsdorf, Heinz G. F.; and Adkins, Charles M., III, 4,415,635., Cl. 428-611.000.
Adlhoch, Richard H., to Motorola, Inc. Memory system having memory cells capable of storing more than two states. 4,415,992., Cl. 365-94.000.
Adret Electronique: *See*—
Remy, Joel, 4,415,854., Cl. 324-79.00R.
AEROPOWER Sarl: *See*—
Carme, Anne M., 4,415,813., Cl. 290-44.000.
Agency of Industrial Science and Technology: *See*—
Sakamoto, Koji, 4,415,989., Cl. 365-19.000.
AGFA-Gevaert AG: *See*—
Huber, Hans-Peter; Burger, Erich; and Bickl, Horst, 4,415,255., Cl. 355-3.00R.
Agnew, David G., to Northern Telecom Limited. Hybrid circuit including capacitive charge-transfer means. 4,415,777., Cl. 179-170.0NC.
Agostine, Doretta: *See*—
Gruber, Robert J.; Bolte, Steven B.; and Agostine, Doretta, 4,415,646., Cl. 430-110.000.
Agrawal, Giridhari L., to United Technologies Corporation. Hydrodynamic fluid film bearing. 4,415,280., Cl. 384-103.000.
Agrawal, Giridhari L., to United Technologies Corporation. Hydrodynamic fluid film bearing. 4,415,281., Cl. 384-103.000.
Ahn, Min H. Tracked vehicle. 4,415,055., Cl. 180-198.000.
Aiba, Toshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Stators of dynamoelectric machines. 4,415,822., Cl. 310-59.000.
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Apparatus for mixing gases. 4,415,508., Cl. 261-114.00R.
Aiman, William R.; and Gregg, David W. Solar coal gasification reactor with pyrolysis gas recycle. 4,415,339., Cl. 48-62.00R.
Air Products and Chemicals, Inc.: *See*—
McWhorter, Thomas E., 4,414,823., Cl. 62-266.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Iwasaki, Shinichiro, 4,414,855., Cl. 73-862.360.
Aizawa, Tatsuo: *See*—
Kouchi, Toshihiro; and Aizawa, Tatsuo, 4,415,645., Cl. 430-107.000.
Ajima, Takashi: *See*—
Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372., Cl. 148-1.500.
Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, to Nippon Telegraph & Telephone Public Corporation. Analog to digital converter. 4,415,882., Cl. 340-347.0AD.
Aktiebolaget Bofors: *See*—
Johansson, Arne; Larsson, Torsten; and Nilsson, Ove, 4,414,764., Cl. 37-141.00T.
Akzo: *See*—
Schutijser, Jan A. J., 4,415,631., Cl. 428-405.000.
Alekhin, Vladimir V.: *See*—
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.
Alephtran Technology N.V.: *See*—
Hyder, Syed S., 4,415,766., Cl. 178-30.000.
Alexander, Louis; and Brown, Willie, Jr. Rope splicer. 4,414,799., Cl. 57-22.000.
Alexander, Timothy C.: *See*—
Griffith, Donald B.; and Alexander, Timothy C., 4,415,812., Cl. 290-38.00R.
Algire, Charles W. Burglar alarm. 4,414,912., Cl. 116-5.000.
Alissandratos, Tacko. Brush holder. 4,415,211., Cl. 312-206.000.
All-Lock Electronics, Inc.: *See*—
Roland, Manfred W.; and Roland, Max G., 4,415,893., Cl. 340-825.310.
Allegheny Ludlum Steel Corporation: *See*—
Reen, Orville W., 4,415,527., Cl. 419-31.000.
Zaremski, Donald R., 4,415,415., Cl. 204-141.500.
Allen-Bradley Company: *See*—
Denes, Oscar L.; Kiphart, Lynn R.; and Szalewski, Paul P., 4,415,607., Cl. 427-96.000.
Allen, James A.; Knight, George W.; and Edmondson, Morris S., to Dow Chemical Company, The. Anti-block additives for olefin polymers. 4,415,691., Cl. 524-114.000.
Allgood, Marvin D., to ADEC, Inc. Computer controlled energy monitoring system. 4,415,896., Cl. 340-870.030.
Alliance Manufacturing Company, Inc., The: *See*—
Carli, Alvin J., 4,414,778., Cl. 49-199.000.
Allied Corporation: *See*—
Grunden, Michael T.; and Roberts, William J., 4,415,328., Cl. 431-1.000.
Meighan, Richard M.; and Cash, Harry R., Jr., 4,415,638., Cl. 429-225.000.
Nijman, John P., 4,414,740., Cl. 29-751.000.
Pressley, Robert J., 4,415,373., Cl. 148-1.500.
Reich, Gregory N., 4,415,410., Cl. 204-2.100.
Zudkevitch, David; and Belsky, Stephen E., 4,415,409., Cl. 203-51.000.
Allmendinger, James M.; and Thornton, James O. Injection tank for cleaning boilers and heat exchangers. 4,415,369., Cl. 134-22.120.
Alperson, Paul. Frame connector structure. 4,415,292., Cl. 403-246.000.
Alps Electric Co., Ltd.: *See*—
Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, 4,414,893., Cl. 101-93.150.
Yoshisato, Akiyuki, 4,415,929., Cl. 358-171.000.
American Cyanamid Company: *See*—
Grudzinskas, Charles V.; and Nachtigall, Guenter W., 4,415,501., Cl. 260-429.300.
Grudzinskas, Charles V.; and Weiss, Martin J., 4,415,746., Cl. 560-61.000.
American Hoechst Corporation: *See*—
Simpson, Carroll; and Schierl, Ludwig, 4,414,756., Cl. 34-23.000.
American Optical Corporation: *See*—
Bard, George D.; and Dusza, Robert J., 4,414,872., Cl. 83-171.000.
Amey, Edward: *See*—
Young, David M.; Mitchell, Donald F.; and Amey, Edward, 4,414,972., Cl. 128-200.230.
AMF Incorporated: *See*—
Sherwood, John R., 4,415,850., Cl. 324-51.000.
Amin, Shailesh R. Surgical drape. 4,414,968., Cl. 128-132.00D.
AMP Incorporated: *See*—
Asick, John C., 4,415,223., Cl. 339-276.00R.
Caron, Bernard G., 4,415,232., Cl. 350-96.210.
AN USSR Institut Elektrosvarki imeni E.O. Patona: *See*—
Podola, Nikolai V.; Kuchuk-Yatsenko, Sergei I.; Krivonos, Vadim P.; and Grabchev, Boris L., 4,415,793., Cl. 219-110.000.
Anabuki, Hitoshi; and Miyata, Shigeo, to Kyowa Chemical Industry C. Ltd. Composition and method for treating iron deficiency syndrome. 4,415,555., Cl. 424-147.000.
Anathasubramanian, Lakshminarayan; Kelly, T. Ross; and Vaya, Jacob, to Research Corporation. Synthesis of daunomycinone and the derivatives thereof. 4,415,498., Cl. 260-351.100.
Ancra Corporation: *See*—
Prete, Ernest, Jr., 4,414,713., Cl. 24-193.000.
Andersen, Geert; and Lemke, Manfred, to August Storck KG. Coated confectionery with a high protein content and process for production thereof. 4,415,596., Cl. 426-103.000.
Andersen, Willy: *See*—
Lundsgaard, Finn C.; and Andersen, Willy, 4,415,534., Cl. 422-58.000.
Angevine, Philip J., to Mobil Oil Corporation. Process for increasing the cetane index of distillate obtained from the hydroprocessing of residua. 4,415,436., Cl. 208-89.000.

Angioletti, Attilio, to Industrie Pirelli S.p.A. Slab for flooring. 4,415,616., Cl. 428-48.000.

Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., to Murray Corporation. Wire grip hose clamp. 4,414,715., Cl. 24-283.000.

Ansell, Raymond O.: *See—*
Robinson, Graham; Ansell, Raymond O.; and McNamee, Michael, 4,415,637., Cl. 429-218.000.

Aoki, Takao: *See—*
Inoue, Takahiro; Takada, Yusaku; and Aoki, Takao, 4,415,256., Cl. 355-3.0TR.

Aoyagi, Yoshiaki: *See—*
Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570., Cl. 424-249.000.

Applications Mecaniques et Robinetterie Industrielle A.M.R.I.: *See—*
Bonafous, Maurice, 4,415,170., Cl. 277-163.000.

Applied Coatings International, Inc.: *See—*
Beale, Harry A., 4,415,420., Cl. 204-192.00N.

Araki, Kazuhiro: *See—*
Matsumoto, Akio; Inazumi, Koichi; and Araki, Kazuhiro, 4,415,274., Cl. 368-160.000.

Araki, Minoru: *See—*
Furukawa, Akira; Araki, Minoru; and Genma, Hideyuki, 4,415,195., Cl. 296-146.000.

Arata, Ryozo: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,415,688., Cl. 524-102.000.

Arbed S.A.: *See—*
Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358., Cl. 75-58.000.

Archenholtz, Ake, to ASEA AB. Nodular iron making and/or storing. 4,415,362., Cl. 75-130.00B.

Archer, Gene R. Gardening tool. 4,414,797., Cl. 56-400.190.

Armstrong World Industries, Inc.: *See—*
Graybeal, Harold N., 4,414,915., Cl. 118-213.000.
Hoyle, Charles E.; and Lenox, Ronald S., 4,415,334., Cl. 8-694.000.
Lenox, Ronald S.; and Hoyle, Charles E., 4,415,332., Cl. 8-444.000.

Arneklev, Duane R.: *See—*
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,352., Cl. 71-88.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,353., Cl. 71-100.000.

Arnold, William T.: *See—*
Brouwer, Gerardus J.; and Arnold, William T., 4,415,302., Cl. 414-417.000.

Arthur Shaw Manufacturing Company: *See—*
Douglas, Jack E., 4,414,706., Cl. 16-370.000.

Asahara, Yoshiyuki; and Izumitani, Tetsuro, to Hoya Corporation. Faraday rotation glass. 4,415,464., Cl. 252-62.510.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, 4,415,726., Cl. 528-272.000.

Asami, Masahiro: *See—*
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,415,703., Cl. 525-54.210.

Asano, Mitsuru: *See—*
Yasuda, Eturo; Asano, Mitsuru; and Ohta, Minoru, 4,415,876., Cl. 338-34.000.

ASEA AB: *See—*
Archenholtz, Ake, 4,415,362., Cl. 75-130.00B.

Ashley, James R.; Barley, Thomas A.; and Rast, Gustaf J., Jr., to United States of America, Army. Single hybrid junction frequency discriminator. 4,415,852., Cl. 324-57.00N.

Asick, John C., to AMP Incorporated. Interlocking crimp sleeve and method of securing to connector. 4,415,223., Cl. 339-276.00R.

Aso, Shin'ichi: *See—*
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958., Cl. 126-450.000.

Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere: *See—*
Loigerot, Jean, 4,414,876., Cl. 83-830.000.

Atasi Corporation: *See—*
Gibeau, Frank C.; and Farmer, Paul L., 4,415,941., Cl. 360-106.000.

Atkinson, Gerald O., to Hughes Tool Company. Triad for rock bit assembly. 4,414,734., Cl. 29-464.000.

Atlantic Richfield Company: *See—*
Kutta, Helmuth W.; and Wunderlich, Donald K., 4,415,337., Cl. 44-24.000.

Atterbury, Leslie G., to Rolls-Royce Limited. Gas turbine engine seal. 4,415,309., Cl. 415-170.00R.

Audi NSU Auto Union AG: *See—*
Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, 4,415,148., Cl. 267-122.000.

Augat Inc.: *See—*
Holt, Richard C., 4,414,741., Cl. 29-837.000.

August Storck KG: *See—*
Andersen, Geert; and Lemke, Manfred. 4,415,596., Cl. 426-103.000.

Augustine, Paul M. Counterbore boring and refacing tool. 4,414,869., Cl. 82-4.00R.

Aument, Patrick E.: *See—*
Utsch, Francis V.; de la Burde, Roger Z.; Aument, Patrick E.; and Merritt, Henry B., 4,414,987., Cl. 131-296.000.

Australian Atomic Energy Commission: *See—*
Sowerby, Brian D., 4,415,804., Cl. 250-255.000.

Australian Diary Corporation: *See—*
Czulak, Jozeph; and Hammond, Leslie A., 4,415,594., Cl. 426-36.000.

Automation Industries, Inc.: *See—*
Russell, Robinson C., 4,415,967., Cl. 364-168.000.

Automobiles Citroen: *See—*
Menard, Christian; Marouby, Daniel; and Chollet, Alain, 4,414,804., Cl. 60-39.141.

Automobiles Peugeot: *See—*
Menard, Christian; Marouby, Daniel; and Chollet, Alain, 4,414,804., Cl. 60-39.141.

Avar, Lajos; Kalt, Evelyne; and Reinshagen, Hellmuth, to Sandoz Ltd. Organic compounds. 4,415,687., Cl. 524-102.000.

Avco Corporation: *See—*
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609., Cl. 427-249.000.

Aviation Instrument Manufacturing Corporation: *See—*
Brady, Robert H.; Beaumont, Michael L.; and Pettis, Arthur C., 4,415,879., Cl. 340-27.0NA.

AVX Corporation: *See—*
Rawal, Bharat, 4,414,844., Cl. 73-104.000.

Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, to Mitsubishi Petrochemical Co. Ltd. Silver-based catalyst containing chlorine as an anionic component for the production of ethylene oxide. 4,415,476., Cl. 502-224.000.

Azuma, Masaaki: *See—*
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,415,708., Cl. 525-316.000.

B. F. Goodrich Company, The: *See—*
Barnes, Thomas E.; and Landsness, Clifford A., 4,414,874., Cl. 83-488.000.
Chasar, Dwight W., 4,415,686., Cl. 524-101.000.
Lai, John T.; and Son, Pyong N., 4,415,684., Cl. 524-92.000.

B. P. Australia Ltd.: *See—*
Mainwaring, David E.; and Jones, Charles U., 4,415,335., Cl. 44-1.00C.

B.S.P. Packaging Systems Di Pattarozzi D. & C. S.A.S.: *See—*
Pattarozzi, Domenico, 4,414,789., Cl. 53-566.000.

Baba, Keikichi: *See—*
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, 4,415,713., Cl. 526-125.000.

Baba, Yasuo: *See—*
Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370., Cl. 148-1.500.

Babbitt, Richard W.: *See—*
Stern, Richard A.; and Babbitt, Richard W., 4,415,871., Cl. 333-1.100.

Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., to Coca-Cola Company, The. Display panel for vending machines. 4,414,768., Cl. 40-584.000.

Bahrmann, Heinrich: *See—*
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495., Cl. 260-239.00D.

Baier, Manfred: *See—*
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.

Bailly, Emile, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Screen printing apparatus. 4,414,894., Cl. 101-123.000.

Baker International Corporation: *See—*
Brooks, Robert T., 4,415,037., Cl. 166-331.000.
Kim, Yung J., 4,415,169., Cl. 277-125.000.
Schmuck, Phillip W., 4,415,038., Cl. 166-373.000.

Baker Oil Tools, Inc.: *See—*
Carmody, Michael A.; and Cognevich, Michael L., 4,415,036., Cl. 166-324.000.

Baker, Robert L., to Joy Manufacturing Company. Heat exchanger assembly. 4,415,024., Cl. 165-160.000.

Bakewell, Joseph J., to Dynamics Research Corporation. Method of fabricating an electrostatic print head. 4,415,403., Cl. 156-634.000.

Balash, Frederick A.: *See—*
Daugherty, James B.; and Balash, Frederick A., 4,415,780., Cl. 200-5.00A.

Balchunas, Charles A., to General Electric Company. Electric iron with unitary thermostat and overtemperature control assembly. 4,415,796., Cl. 219-253.000.

Baldi, Bruno: *See—*
Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, 4,415,304., Cl. 414-589.000.

Ball, Harry J. Fibrous web for planting seeds, method of using same, apparatus for producing same. 4,414,776., Cl. 47-56.000.

Ballard, Douglas F., to Iomega Corporation. Head positioning servo for disk drive. 4,415,939., Cl. 360-75.000.

Balling, Egbert: *See—*
Baum, Hans; and Balling, Egbert, 4,415,196., Cl. 296-201.000.

Bandura, James: *See—*
Nelson Holland, Henry A.; and Bandura, James, 4,414,918., Cl. 118-306.000.

Bantowsky, Klaus-Peter A.: *See—*
Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767., Cl. 381-45.000.

Bar, Alfredo, to Necchi, S.p.A. Muffler for compressors. 4,415,060., Cl. 181-272.000.

Barba, Joseph; and Hochrain, Gerd L., to Boorum & Pease Company. Self-locking nylon post. 4,415,289., Cl. 402-17.000.

Barbieri, Joseph C., to W. H. Brady Co Marker sleeves. 4,415,006., Cl. 138-115.000.

Barcza, Sandor, to Sandoz, Inc. 1-Oxa-2,6-disilacyclohexane-4-carboxamides. 4,415,560., Cl. 424-184.000.

Bard, George D.; and Dusza, Robert J., to American Optical Corporation. Lens tape cutter. 4,414,872., Cl. 83-171.000.

Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., to Imperial Chemical Industries PLC. Heat-treating coated polyolefin films. 4,415,523., Cl. 264-342.00R.

Barley, Thomas A.: *See*—
Ashley, James R.; Barley, Thomas A.; and Rast, Gustaf J., Jr., 4,415,852., Cl. 324-57.00N.

Barmag Barmer Maschinenfabrik AG: *See*—
Dammann, Peter; Schippers, Heinz; and Bauer, Karl, 4,414,803., Cl. 57-340.000.

Barnabeo, Austin E.; and Keogh, Michael J., to Union Carbide Corporation. Curable compositions, based on alkylene-alkyl acrylate copolymers, containing preformed, reactive organo titanate catalysts. 4,415,710., Cl. 525-370.000.
Wagner, James C.; Barnard, James E.; and Woerner, Robert J., 4,416,020., Cl. 378-181.000.

Barnes, Thomas E.; and Landsness, Clifford A., to B. F. Goodrich Company, The. Fabric cutting. 4,414,874., Cl. 83-488.000.

Baron Data Systems: *See*—
Smith, Michael A., 4,415,283., Cl. 400-94.000.

Baron, Walter J.; and Cleaver, Laird C., to Water Services of America, Inc. Mounting for heat exchanger tube cleaner capturing devices. 4,415,022., Cl. 165-95.000.

Barszcz, Chester F.; and Symon, Ted, to UOP Inc. Epiamine-based support matrix. 4,415,664., Cl. 435-176.000.

Barszcz, Chester F.: *See*—
Symon, Ted; and Barszcz, Chester F., 4,415,663., Cl. 435-176.000.

Barth, Peter: *See*—
Cioca, Gheorge; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628., Cl. 428-335.000.

Bartky, Scott: *See*—
Mulvanny, Patrick; and Bartky, Scott, 4,415,921., Cl. 358-139.000.

BASF Aktiengesellschaft: *See*—
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571., Cl. 424-250.000.

BASF Wyandotte Corporation: *See*—
Cassell, Ronald L.; and Hall, Thomas N., 4,415,355., Cl. 71-121.000.

Basta, Michael I. Continuous flushing device. 4,414,999., Cl. 137-240.000.

Battelle Memorial Institute: *See*—
Throner, Guy C., 4,414,880., Cl. 89-193.000.
Verber, Carl M.; and Kenan, Richard P., 4,415,226., Cl. 350-96.140.

Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, to Boehringer Mannheim GmbH; and Tschechoslowakische Academie der Wissenschaften. Hydrophilic latex particles and use thereof. 4,415,700., Cl. 524-548.000.

Baudin, Lucien, to IDRAM Engineering Company EST. Rotary machine with controlled retractable elements. 4,415,322., Cl. 418-260.000.

Bauer, Barry J., to Celanese Corporation. Water soluble thickeners. 4,415,701., Cl. 524-612.000.

Bauer, Karl: *See*—
Dammann, Peter; Schippers, Heinz; and Bauer, Karl, 4,414,803., Cl. 57-340.000.

Bauer, Steven W., to General Motors Corporation. Vehicle hatchback closure. 4,415,194., Cl. 296-76.000.

Bauer, William V., to Lummus Company, The. Solid waste treatment in reduction of iron ore. 4,415,357., Cl. 75-29.000.

Baugh, Daniel W., Jr.: *See*—
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, 4,415,502., Cl. 260-463.000.

Baum, Hans; and Balling, Egbert, to Saint-Gobain Vitrage. Glass with conductive strips for supplying windshield wiper. 4,415,196., Cl. 296-201.000.

Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,415,677., Cl. 521-28.000.
Lee, John M.; and Bauman, William C., 4,415,678., Cl. 521-28.000.

Baumeister, Hans P. A., to Eastman Kodak Company. Combined flash tube and quench tube apparatus. 4,415,840., Cl. 315-323.000.

Baumgartner, Armin: *See*—
Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, 4,415,642., Cl. 430-86.000.

Bavnsfelt, Hans, to Mogens Rued Nielsen ApS. Safety cap. 4,415,094., Cl. 215-252.000.

Baxter, Douglas G.: *See*—
Garner, John N.; Roberge, Jean M.; and Baxter, Douglas G., 4,414,802., Cl. 57-293.000.

Baxter Travenol Laboratories, Inc.: *See*—
Feldman, Gary, 4,415,843., Cl. 318-139.000.
Grimes, Robert G., 4,415,393., Cl. 156-244.130.

Bayer Aktiengesellschaft: *See*—
Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, 4,415,561., Cl. 424-219.000.
Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, 4,415,692., Cl. 524-183.000.
Kabbe, Hans-Joachim, 4,415,741., Cl. 549-345.000.
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586., Cl. 424-273.00R.
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557., Cl. 424-172.000.
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719., Cl. 528-167.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,415,354., Cl. 71-103.000.

Bayless, John R.; Hargrove, Homer G.; and Thompson, Edwin G., to Westinghouse Electric Corp. Positioning a thin wall round wrapper within a heavy wall out-of-round shell of a heat exchanger. 4,415,021., Cl. 165-76.000.

Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, to Intel Corporation. Macroinstruction translator unit for use in a microprocessor. 4,415,969., Cl. 364-200.000.

BBC Aktiengesellschaft, Brown, Boveri & Cie.: *See*—
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952., Cl. 123-559.000.

BBC Brown, Boveri & Company, Limited: *See*—
Perregaux, Alain, 4,415,236., Cl. 350-338.000.

Beale, Harry A., to Applied Coatings International, Inc. Cubic boron nitride preparation. 4,415,420., Cl. 204-192.00N.

Beaucage, Serge L.: *See*—
Caruthers, Marvin H.; and Beaucage, Serge L., 4,415,732., Cl. 536-27.000.

Beaumont, Michael L.: *See*—
Brady, Robert H.; Beaumont, Michael L.; and Pettis, Arthur C., 4,415,879., Cl. 340-27.0NA.

Beck, Jurgen; and Rohrig, Herbert, to Dr. Madaus & Co. Optical scanning apparatus. 4,415,811., Cl. 250-560.000.

Becker, Gerhard, to U.S. Philips Corporation. Device for inserting and ejecting a diskette cartridge into or from a drive mechanism. 4,415,940., Cl. 360-99.000.

Becker, Wilhelm, to Hoechst Aktiengesellschaft. Stable aqueous epoxide resin dispersion, a process for its preparation, and its use. 4,415,682., Cl. 523-403.000.

Beecham Group Limited: *See*—
Hunt, Eric, 4,415,584., Cl. 424-272.000.

Beggins, Paul T. Line fastening device. 4,414,712., Cl. 24-129.00R.

Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, to Bayer Aktiengesellschaft. Synergistic arthropodicidal composition. 4,415,561., Cl. 424-219.000.

Beia, Thomas S., to Cadillac Rubber & Plastics, Inc. Bearing seal assembly with dual annular support rings. 4,415,166., Cl. 277-51.000.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, to ITT Industries, Inc. Arrangement for controlling the pressure in brake actuating cylinders of a vehicle. 4,415,210., Cl. 303-116.000.

Belinsky, Sidney I. Berth for mooring supply ship to an offshore platform and for transferring personnel between them. 4,414,911., Cl. 114-219.000.

Bell, Anthony J., to Goodyear Tire & Rubber Company, The. Catalysts for ring-opening copolymerization of cycloolefins. 4,415,715., Cl. 526-142.000.

Bell, Malcolm C.: *See*—
Victorovich, Grigori S.; and Bell, Malcolm C., 4,415,356., Cl. 75-21.000.

Bell Telephone Laboratories, Incorporated: *See*—
Burton, Randolph H.; Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,415,414., Cl. 204-129.300.
Gans, Michael J., 4,415,901., Cl. 343-754.000.
Gitlin, Richard D., 4,416,015., Cl. 375-14.000.
Harmon, William R., Jr., 4,415,961., Cl. 363-43.000.
Huizinga, Donald D.; and Thompson, Paul W., 4,416,007., Cl. 370-62.000.
Iapicco, Jeffrey A., 4,416,016., Cl. 375-85.000.
Jin, Sungho; and Tiefel, Thomas H., 4,415,380., Cl. 148-101.000.
Kant, Rishi, 4,415,220., Cl. 339-221.00R.
Karabinis, Peter D., 4,415,872., Cl. 333-18.000.
McCullough, Harold E., 4,415,229., Cl. 350-96.200.
Muoi, Tran V., 4,415,803., Cl. 250-214.00A.
Stanley, Frank L., 4,415,228., Cl. 350-96.200.

Belov, Petr S.: *See*—
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477., Cl. 502-178.000.

Belsky, Stephen E.: *See*—
Zudkevitch, David; and Belsky, Stephen E., 4,415,409., Cl. 203-51.000.

Bendix Corporation, The: *See*—
Gaiser, Robert F., 4,414,811., Cl. 60-589.000.
Gumkowski, Bert A.; and Limberg, John F., 4,415,068., Cl. 188-72.300.
McDaniel, George H.; and Hartford, Thomas W., 4,415,985., Cl. 364-900.000.
Punako, Stephen; and MacAvoy, David W., 4,415,213., Cl. 339-49.00R.
Sanftleben, Keith E.; and Tarr, Walter R., 4,415,363., Cl. 75-229.000.
Taig, Alistair G., 4,415,002., Cl. 137-625.230.

Benham, Albert A., to Champion International Corporation. Multi-pocket pad retaining folder and blank therefor. 4,415,183., Cl. 281-31.000.

Bennett, John T., Jr. Inoculum tray. 4,415,086., Cl. 206-564.000.

Benson, Terrence M., to Oil & Sales Limited Partnership. Hydraulic actuator for well pumps. 4,414,808., Cl. 60-372.000.

Bente, Alfred, to Messrs. Adidas Sportschuhfabriken Adi Dassler KG. Sole for a sports shoe or boot. 4,414,763., Cl. 36-134.000.

Bentley, Joseph J.; Brown, Thomas E.; and Unrine, Jerome, to Industrial Cleaning and Coating, Inc. System for selectively treating cables and the like. 4,414,917., Cl. 118-695.000.

Benton, Kenneth C.; Cmolik, Brian L.; and Weinert, Raymond J., to Standard Oil Company, The. Catalysts useful for the polymerization of alpha-olefins. 4,415,474., Cl. 502-117.000.

Benton, Stephen A.; Houde-Walter, William R.; and Mingace, Herbert S., Jr., to Polaroid Corporation. Methods of making holographic images. 4,415,225., Cl. 350-3.840.

Benz, Gunter: *See*—
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557., Cl. 424-172.000.

Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, to Ceskoslovenska akademie ved. Method and equipment for treatment of fuel for fluidized bed combustion. 4,414,905., Cl. 110-245.000.

Berg, Allan. Method and means for packaging expansible products. 4,414,788., Cl. 53-436.000.

Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., to Reseal Corporation of America, The. Valve for spraying a mist. 4,415,121., Cl. 239-229.000.

Berggren, Mark H.: *See*—
Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., 4,415,542., Cl. 423-141.000.

Bergwerksverband GmbH: *See*—
Knoblauch, Karl; and Heimbach, Heinrich, 4,415,340., Cl. 55-25.000.

Berlex Laboratories, Inc.: *See*—
Diamond, Julius; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,415,587., Cl. 424-273.00R.

Berlin, Semen S.: *See*—
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.

Bernes, Wayne: *See*—
Rezewski, Joe; and Bernes, Wayne, 4,415,026., Cl. 166-97.000.

Bernstein, Harold: *See*—
Bice, James W.; Gravel, Charles L.; and Bernstein, Harold, 4,414,837., Cl. 73-1.00B.

Bernstein, Ragnar: *See*—
Borking, Lars-Olof; and Bernstein, Ragnar, 4,415,119., Cl. 237-19.000.

Berry, Peter W., to Smith and Nephew Associated Companies Limited. Elastic bandages. 4,414,970., Cl. 128-156.000.

Bertaux, Paul: *See*—
Mansel, Jean E.; Masson, Charlie M. P.; Bertaux, Paul; and Grosmaitre, Andre M. J., 4,415,461., Cl. 210-757.000.

Bertelsen Inc.: *See*—
Bertelsen, William R.; and Bertelsen, William D., 4,415,131., Cl. 244-13.000.

Bertelsen, William D.: *See*—
Bertelsen, William R.; and Bertelsen, William D., 4,415,131., Cl. 244-13.000.

Bertelsen, William R.; and Bertelsen, William D., to Bertelsen Inc. Arc wing aircraft. 4,415,131., Cl. 244-13.000.

Bertus, Brent J.: *See*—
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., 4,415,440., Cl. 208-120.000.

Besemann, Alfred; and Rehwald, Willi, to E.C.H. Will (GmbH & Co.). Driving unit for the knife holders of cross cutters or the like. 4,414,873., Cl. 83-311.000.

BetaMED Pharmaceuticals, Inc.: *See*—
Gerzon, Koert, 4,415,590., Cl. 424-319.000.

Bethge, Horst: *See*—
Martens, Jurgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738., Cl. 548-147.000.

Bethlehem Steel Corporation: *See*—
Bramfitt, Bruce L.; Hansen, Steven S.; Harper, Donald L.; and Pradhan, Roger R., 4,415,376., Cl. 148-12.00F.

Bettencourt, Darryl G.; and Szoboszlay, Akos I., to Blackwelders. Height control for agricultural machine. 4,414,792., Cl. 56-10.200.

Betts, E. Douglas, to Gregor Jonsson Associates, Inc. Shrimp processing machine having improved cutting structure. 4,414,709., Cl. 17-71.000.

Beuse, Robert H. J.; van Iterson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., to N.V. Tot Keuring van Elektrotechnische Materialen. Method and a meter for measuring quantities of heat. 4,415,279., Cl. 374-204.000.

Bianchi, Giuseppe: *See*—
Priaroggia, Paolo G.; Bianchi, Giuseppe; and Sala, Angelo, 4,415,764., Cl. 174-37.000.

Bice, James W.; Gravel, Charles L.; and Bernstein, Harold, to Plevy, Arthur L. Apparatus and methods for the shunt calibration of semiconductor strain gage bridges. 4,414,837., Cl. 73-1.00B.

Bickl, Horst: *See*—
Huber, Hans-Peter; Burger, Erich; and Bickl, Horst, 4,415,255., Cl. 355-3.00R.

Biddlecom, William G.: *See*—
Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,415,592., Cl. 424-331.000.

Bilofsky, Ruth C.; and Sahatjian, Ronald A., to Polaroid Corporation. Variable density photographic transparencies. 4,415,648., Cl. 430-220.000.

Birkle, Siegried; Gehring, Johann; and Stoger, Klaus, to Siemens Aktiengesellschaft. Apparatus for electro-depositing aluminum. 4,415,422., Cl. 204-199.000.

Biscoe, Thomas S.; and Taylor, Rodney S., to Simmons Universal Corporation. Seating spring assembly and method. 4,415,147., Cl. 267-111.000.

Black & Decker Inc.: *See*—
Langenberg, Anthony J., 4,414,782., Cl. 51-170.0MT.
Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodowsky, Stanley, Jr., 4,414,781., Cl. 51-170.0MT.
Pioch, Peter P.; and Schober, Annette, 4,414,743., Cl. 30-124.000.

Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., to Fiber Industries, Inc. Process for making spun-like yarn with variable denier filaments. 4,414,801., Cl. 57-288.000.

Blackwelders: *See*— James I
Bettencourt, Darryl G.; and Szoboszlay, Akos I., 4,414,792., Cl. 56-10.200.

Blanchard, Robert R.; and Bourne, Tommy R., to Dow Chemical Co., The. Processing modifier for polyolefins. 4,415,707., Cl. 525-231.000.

Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., to Hoechst Aktiengesellschaft. Bis-betaines, a process for their preparation, and cleaning agents containing these compounds. 4,415,487., Cl. 252-546.000.

Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., to Hoechst Aktiengesellschaft. Triamine-trioxides, a process for their preparation, and cleaning agents containing these compounds. 4,415,488., Cl. 252-547.000.

Bleckmann, Hans-Wilhelm: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210., Cl. 303-116.000.

Blickstein, Martin J., to Murata Corporation of America. Air trimmer capacitor. 4,415,949., Cl. 361-296.000.

Blizard, Robert B., to Schlumberger Technology Corp. Segmented acoustic transmitter for broad frequency investigation of a borehole. 4,415,998., Cl. 367-25.000.

Block, Hans-Dieter: *See*—
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719., Cl. 528-167.000.

Blum, Klaus; and Strasser, Rudolf, to Wacker-Chemie GmbH. Process for the manufacture of palladium(II) catalyst and for the manufacture of alkenyl esters of carboxylic acids employing said catalyst. 4,415,499., Cl. 260-410.90N.

Board of Trustees, a Constitutional corporation operating Michigan State University: *See*—
Dilley, David R.; Lee, Julian J. L.; and Saltveit, Mikal E., Jr., 4,414,839., Cl. 73-23.000.

BOC Group, Inc., The: *See*—
Stanescu, Mircea-Stefan; and Fitzgerald, William T., 4,415,379., Cl. 148-16.000.

Boddicker, Mark J. Transporter-unloader for large cylindrical hay bales. 4,415,300., Cl. 414-24.500.

Boehringer Ingelheim GmbH: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,415,566., Cl. 424-246.000.

Boehringer Mannheim GmbH: *See*—
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.

Boeke, Wouter M., to U.S. Philips Corporation. Variable-gain amplifier stage equipped with field-effect transistors. 4,415,864., Cl. 330-253.000.

Boge GmbH: *See*—
Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, 4,415,148., Cl. 267-122.000.

Bolen, George F. Textile carding machine feed assembly and method. 4,414,710., Cl. 19-105.000.

Bolhofer, William A.; and Prugh, John D., to Merck & Co., Inc. Suppression of gastric acid secretion using pyrimidylcarbamates. 4,415,575., Cl. 424-251.000.

Boliden Aktiebolag: *See*—
Leirnes, Johan S.; and Lundstrom, Malkolm S., 4,415,360., Cl. 75-65.00R.

Boll & Kirch Filterbau GmbH: *See*—
Lennartz, Rudiger; and Gutermuth, Joachim, 4,415,448., Cl. 210-333.100.

Bolte, Steven B.: *See*—
Gruber, Robert J.; Bolte, Steven B.; and Agostine, Doretta, 4,415,646., Cl. 430-110.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,415,039., Cl. 172-47.000.

Bonafous, Maurice, to Applications Mecaniques et Robinetterie Industrielle A.M.R.I. Double toric sealing ring. 4,415,170., Cl. 277-163.000.

Bonfiglioli, Giampaolo: *See*—
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,415,185., Cl. 285-114.000.

Bonin, Jean-Claude, to CAV RotoDiesel. Dual-range mechanical governor for fuel injection pumps. 4,414,945., Cl. 123-368.000.

Bonomi, Luciano: *See*—
Gamba, Giancesare; and Bonomi, Luciano, 4,415,564., Cl. 424-244.000.
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., to U.S. Philips Corporation. Resistive paste for a resistor body. 4,415,486., Cl. 252-514.000.
Boorman, Roy S.: *See*—
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,415,540., Cl. 423-99.00R.
Boorum & Pease Company: *See*—
Barba, Joseph; and Hochrain, Gerd L., 4,415,289., Cl. 402-17.000.
Boots Company PLC, The: *See*—
Walker, Robert A., 4,415,944., Cl. 361-42.000.
Borel, Georg, to Hermann Wangner GmbH & Co. KG. Spiral linkage belt and method of making same. 4,415,625., Cl. 428-222.000.
Borg-Warner Ltd.: *See*—
Turbard, Alan M.; and Foley, Peter N., 4,414,818., Cl. 62-176.100.
Boring, Dougias J., to Conair, Inc. Vacuum material transporting system. 4,415,297., Cl. 406-168.000.
Borking, Lars-Olof; and Bernstein, Ragnar, to Fagersta AB. Boiler. 4,415,119., Cl. 237-19.000.
Bos, Kari E. O., to Carnation Company. Gravy or sauce mix. 4,415,599., Cl. 426-578.000.
Bose, Herbert. Rucksack assembly. 4,415,012., Cl. 150-51.000.
Bossard, Max: *See*—
Keller, Hans-Peter; and Bossard, Max, 4,415,008., Cl. 139-370.200.
Botez, Dan; and Ettenberg, Michael, to RCA Corporation. W-Guide buried heterostructure laser. 4,416,012., Cl. 372-45.000.
Bottcher, Henry: *See*—
Klotz, Peter; and Bottcher, Henry, 4,415,144., Cl. 266-228.000.
Bottenbruch, Ludwig: *See*—
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719., Cl. 528-167.000.
Bouchal, Karel: *See*—
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.
Bouck, Larry S., to Cities Service Company. Electrode well completion. 4,415,034., Cl. 166-302.000.
Boudreault, Laurent. Material spreading implement. 4,415,104., Cl. 222-610.000.
Bouiller, Jean G.; Crozet, Francois E. G.; and Soligny, Marcel R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". System for cooling a gas turbine by bleeding air from the compressor. 4,415,310., Cl. 416-95.000.
Bourdeau, Romeo G., to United Technologies Corporation. Rotary atomizing process. 4,415,511., Cl. 264-8.000.
Bourne, Carol. Combination infant seat and swing. 4,415,200., Cl. 297-174.000.
Bourne, Tommy R.: *See*—
Blanchard, Robert R.; and Bourne, Tommy R., 4,415,707., Cl. 525-231.000.
Bourque, Joseph A.: *See*—
Wedman, Leonard N.; and Bourque, Joseph A., 4,415,821., Cl. 310-12.000.
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, to La Telemecanique Electrique. Pneumatic switch. 4,415,004., Cl. 137-884.000.
Bouthors, Pierre; and Breting, Olivier, to Regie Nationale des Usines Renault. Hydraulic generator with free-piston engine. 4,415,313., Cl. 417-38.000.
Bowman, Howard C., to Western Electric Company, Inc. Methods of and apparatus for testing telephone subscriber loop to locate a fault relative to a reference point. 4,415,779., Cl. 179-175.30F.
Bowman, Walker H.: *See*—
Stasi, Michael A.; Bowman, Walker H.; and Rader, Edward F., 4,415,336., Cl. 44-13.000.
Bowman, Wayne A.: *See*—
Klein, Gerald W.; and Bowman, Wayne A., 4,415,647., Cl. 430-213.000.
Boyer, Bernard: *See*—
Contal, Francois; and Boyer, Bernard, 4,414,819., Cl. 62-222.000.
Boyer, Thomas B. Holder for uniformly shaped articles. 4,415,092., Cl. 211-60.00R.
Boyles, David A.; Gaines, Jack R.; and Haissig, Bruce E., to United States of America, Agriculture. Auxin compositions of phenyl thioesters of indole-3-alkanoic acids and their use as auxin growth regulators. 4,415,350., Cl. 71-77.000.
Braat, Josephus J. M.; Haisma, Jan; and Prast, Gijsbert, to U.S. Philips Corporation. Single lens having one spherical and one aspherical refractive surface. 4,415,238., Cl. 350-432.000.
Brabson, Joseph B.: *See*—
Cioca, Gheorge; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628., Cl. 428-335.000.
Bradshaw, Lawrence R., Jr.: *See*—
Coffman, Moody L.; and Bradshaw, Lawrence R., Jr., 4,415,459., Cl. 210-747.000.
Brady, Robert H.; Beaumont, Michael L.; and Pettis, Arthur C., to Aviation Instrument Manufacturing Corporation. Aircraft flight instrument display system. 4,415,879., Cl. 340-27.0NA.
Bramfitt, Bruce L.; Hansen, Steven S.; Harper, Donald L.; and Pradhan, Roger R., to Bethlehem Steel Corporation. Formable high strength low alloy steel sheet. 4,415,376., Cl. 148-12.00F.
Brand, Leonard J.; and Nadelson, Jeffrey, to Sandoz, Inc. Isoxazolyl indolamines for treating diabetes. 4,415,568., Cl. 424-248.400.
Brandes, Wilhelm: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586., Cl. 424-273.00R.
Braun Aktiengesellschaft: *See*—
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273., Cl. 368-74.000.
Bray, Murel B. Needle positioner for sewing machine. 4,414,909., Cl. 112-274.000.
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V. Method and apparatus for injecting samples into gas chromatograph. 4,414,857., Cl. 73-863.110.
Brearley, Gordon D. Seat for invalid walker. 4,415,198., Cl. 297-6.000.
Breitweiser, Steve; and Nelson, David. Method for turbocharger repair. 4,414,725., Cl. 29-156.40R.
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., to Corning Glass Works. Glass-ceramic compositions of high refractoriness. 4,415,672., Cl. 501-4.000.
Brenneman, Ben, to Wixlin, Inc. Transverse axis fluid turbine. 4,415,312., Cl. 416-119.000.
Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, to Olin Corporation. Start-up and steady state process control for cooperative rolling. 4,414,832., Cl. 72-8.000.
Brenneman, William L.: *See*—
Pryor, Michael J.; and Brenneman, William L., 4,415,377., Cl. 148-12.00R.
Breting, Olivier: *See*—
Bouthors, Pierre; and Breting, Olivier, 4,415,313., Cl. 417-38.000.
Bretschneider, Hans-Jurgen, to Dr. Franz Kohler Chemie GmbH. Protective solution for heart and kidney and process for its preparation. 4,415,556., Cl. 424-153.000.
Briggs & Stratton Corporation: *See*—
Pribnow, Gary P., 4,414,933., Cl. 123-182.000.
Vogl, Norbert M.; Gaulke, Ronald R.; and Harkness, Joseph R., 4,414,934., Cl. 123-192.00B.
Brima, Thomas S.: *See*—
Kwiatek, Jack; and Brima, Thomas S., 4,415,475., Cl. 502-206.000.
Brinkmann, Heinz; and Chszaniecki, Siegfried, to Hermann Berstorff Maschinenbau GmbH. Twin screw extruders. 4,415,268., Cl. 366-85.000.
Brinton, Charles E., Sr. Maxi-ball lubricator. 4,414,770., Cl. 42-90.000.
British Gas Corporation: *See*—
Tomas, Pantcho, 4,415,361., Cl. 75-124.000.
Brodie, Don E.; and Morgan, John H., to Canadian Industrial Innovation Centre/Waterloo. Reactive plating method and product. 4,415,602., Cl. 427-39.000.
Brody, Samuel S. Optical devices for use in moisture laden atmosphere. 4,414,693., Cl. 2-435.000.
Broken Hill Proprietary Company Ltd., The: *See*—
Mainwaring, David E.; and Jones, Charles U., 4,415,335., Cl. 44-1.00C.
Brokke, Mervin E.: *See*—
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,352., Cl. 71-88.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,353., Cl. 71-100.000.
Brooks, John P.: *See*—
Brooks, Paul; and Brooks, John P., 4,414,865., Cl. 81-3.10R.
Brooks, Paul; and Brooks, John P. Beverage bottle and can opener. 4,414,865., Cl. 81-3.10R.
Brooks, Robert T., to Baker International Corporation. Ball valve loading apparatus. 4,415,037., Cl. 166-331.000.
Brooks, Rodney A.: *See*—
Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, 4,415,807., Cl. 250-363.00S.
Brooks, William C., to RCA Corporation. Electroforming apparatus for use in matrixing of record molding parts. 4,415,423., Cl. 204-212.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Sugita, Yoshimori, 4,414,827., Cl. 66-60.00H.
Brouwer, Gerardus J.; and Arnold, William T., to Brouwer Turf Equipment Limited. Pallet retrieving mechanism for forklift vehicle. 4,415,302., Cl. 414-417.000.
Brouwer Turf Equipment Limited: *See*—
Brouwer, Gerardus J.; and Arnold, William T., 4,415,302., Cl. 414-417.000.
Brown, Michael H.; and Martin, Roger, to United Kingdom Atomic Energy Authority. Apparatus and a method for indicating variations in acoustic properties on an interface. 4,414,849., Cl. 73-290.00V.
Brown, Robert L., Sr. Device for imaging penetrating radiation. 4,415,810., Cl. 250-484.100.
Brown, Thomas E.: *See*—
Bentley, Joseph J.; Brown, Thomas E.; and Unrine, Jerome, 4,414,917., Cl. 118-695.000.
Brown, Victor R. R.: *See*—
Stephenson, Edgar O.; and Brown, Victor R. R., 4,415,184., Cl. 285-47.000.
Brown & Williamson Tobacco Corporation: *See*—
Porenski, Harry S., Jr.; and Kohnhorst, Earl E., 4,414,841., Cl. 73-61.00R.
Brown, Willie, Jr.: *See*—
Alexander, Louis; and Brown, Willie, Jr., 4,414,799., Cl. 57-22.000.

Brownstein, Arthur M.: *See—*
Ryu, Ji-Yong; and Brownstein, Arthur M., 4,415,745., Cl. 560-25.000.

Brunsch, Klaus; and Schindler, Rudolf, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Connecting rod for an engine. 4,414,860., Cl. 74-579.00E.

Brunswick Corporation: *See—*
Kent, Preben, 4,415,001., Cl. 137-497.000.
Neufeld, Henry L., 4,415,129., Cl. 242-84.20A.

Bryzek, Janusz, to Foxboro Company, The. Pressure transmitter employing non-linear temperature compensation. 4,414,853., Cl. 73-766.000.

Buchanan, Robert A., to Lockheed Missiles & Space Co., Inc. Automated radiographic inspection system. 4,415,980., Cl. 378-58.000.

Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586., Cl. 424-273.00R.

Buckert, Michael D.: *See—*
Mendenhall, Charles E.; and Buckert, Michael D., 4,415,844., Cl. 318-254.000.

Buckley, Douglas I.: *See—*
Janakiraman, Ramachandran; Buckley, Douglas I.; Yamashiro, Donald H.; and Hagman, James R., 4,415,546., Cl. 424-1.100.

Buehler Ltd.: *See—*
Vincent, Donald P., 4,414,783., Cl. 51-267.000.

Buekers, Josef: *See—*
Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, 4,415,692., Cl. 524-183.000.

Buerger, Magdalene: *See—*
Reinartz, Hans-Dieter; and Buerger, Magdalene, 4,414,810., Cl. 60-535.000.

Buhler, Ulrich; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, to Cassella Aktiengesellschaft. Water-insoluble monoazo dyestuffs, their manufacture and their use. 4,415,494., Cl. 260-196.000.

Buisson, Raymond, to Crouzet. Process for making conductor element with double contact face. 4,414,735., Cl. 29-879.000.

Bunge, Lothar P. Apparatus for dressing abrasive wheels. 4,414,955., Cl. 125-11.00T.

Burandt, Corliss O., to Investment Rarities, Incorporated. Variable valve operating mechanism for internal combustion engines. 4,414,931., Cl. 123-90.160.

Buren, Lawrence L.: *See—*
Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., 4,415,351., Cl. 71-87.000.

Burgdorf, Jochen: *See—*
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210., Cl. 303-116.000.

Burger, Erich: *See—*
Huber, Hans-Peter; Burger, Erich; and Bickl, Horst, 4,415,255., Cl. 355-3.00R.

Burkes, Bobby: *See—*
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, 4,415,502., Cl. 260-463.000.

Burnett, Lowell J.: *See—*
Epperson, Bonnie J.; Burnett, Lowell J.; and Helm, Verne D., 4,415,608., Cl. 427-244.000.

Burns, Fredrick B., to EZ Paintr Corporation. Device for preparing a surface for painting. 4,414,700., Cl. 15-105.000.

Burns, William V.: *See—*
Recane, Marion L.; Burns, William V.; McMillen, Charles E.; and Luce, Dan G., 4,415,951., Cl. 362-20.000.

Burris, Darryl L., to General Motors Corporation. Hydraulic power steering and cooling fan drive system for vehicles. 4,414,809., Cl. 60-424.000.

Burroughs Corporation: *See—*
Chadra, David P., 4,415,986., Cl. 364-900.000.
Gryger, Dana A.; and Drogichen, Daniel P., 4,415,984., Cl. 364-900.000.

Burt, Harold S., to Mid-West Conveyor Company, Inc. Apparatus and method for rough positioning a vehicle at a storage bin in an automatic storage and retrieval system. 4,415,975., Cl. 364-444.000.

Burton, Randolph H.; Kohl, Paul A.; and Ostermayer, Frederick W., Jr., to Bell Telephone Laboratories, Incorporated. Etching of optical surfaces. 4,415,414., Cl. 204-129.300.

Bury, John E., to Grafton Limited. Unifilled tape cassette. 4,415,285., Cl. 400-196.100.

Busch, Peter: *See—*
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273., Cl. 368-74.000.

Buschmann, Gerd: *See—*
Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,415,577., Cl. 424-258.000.

Buschmann, Jeffrey P.: *See—*
Oetken, James E.; and Buschmann, Jeffrey P., 4,415,833., Cl. 313-559.000.

Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., to Calgon Corporation. Photopolymerization using copper ions. 4,415,417., Cl. 204-159.240.

Bustos, Rafael T., to Leggett & Platt, Incorporated. Aisle end merchandising display device. 4,415,090., Cl. 211-49.00S.

Butler, Eric S.; Butler, William H., Jr.; and Butler, Malcolm H. Device for bleeding brakes and refilling brake system. 4,415,071., Cl. 188-352.000.

Butler, Malcolm H.: *See—*
Butler, Eric S.; Butler, William H., Jr.; and Butler, Malcolm H., 4,415,071., Cl. 188-352.000.

Butler, William H., Jr.: *See—*
Butler, Eric S.; Butler, William H., Jr.; and Butler, Malcolm H., 4,415,071., Cl. 188-352.000.

Butterworth, Arthur L., to Trane Company, The. Wrap element and tip seal for use in fluid apparatus of the scroll type. 4,415,317., Cl. 418-55.000.

Butterworth, Arthur L.; and Eber, David H., to Trane Company, The. Rolling thrust bearing for use in a scroll machine. 4,415,318., Cl. 418-55.000.

Buysch, Hans-Josef: *See—*
Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, 4,415,692., Cl. 524-183.000.

C. A. Weidmuller GmbH & Co. Postfach: *See—*
Obst, Rudiger, deceased, 4,415,214., Cl. 339-91.00R.

C. D Sparling Company: *See—*
Guenther, Torbett B., 4,415,141., Cl. 256-69.000.

C. I. S. E., SpA: *See—*
Gray, Antonio, 4,415,769., Cl. 179-2.00C.

C. van der Lely N.W.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,415,039., Cl. 172-47.000.

Cabot Corporation: *See—*
Crook, Paul, 4,415,532., Cl. 420-585.000.

Cadillac Rubber & Plastics, Inc.: *See—*
Beia, Thomas S., 4,415,166., Cl. 277-51.000.

Calder, Iain D.: *See—*
Naem, Abdalla A. H.; Calder, Iain D.; and Naguib, Hussein M., 4,415,383., Cl. 148-187.000.

Cale, Roland E., Jr. Method of manufacturing clevis end connecting rod. 4,414,726., Cl. 29-156.50A.

Calgon Corporation: *See—*
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417., Cl. 204-159.240.

California Institute of Technology: *See—*
Rippel, Wally E.; and Edwards, Dean B., 4,415,963., Cl. 363-135.000.

California Interface and Software Limited Partnership: *See—*
Hall, John S.; and Phelps, Barry C., 4,415,612., Cl. 428-29.000.

Camco, Incorporated: *See—*
Watkins, Fred E., 4,415,028., Cl. 166-206.000.

Campbell, Charles E. Soft contact lens container. 4,415,076., Cl. 206-5.100.

Campbell, Chris A.; and Overbeek, Robert B., to Dana Corporation. Automatic hub clutch. 4,415,073., Cl. 192-54.000.

Campbell, Willis R., to Sperry Corporation. Method of releasing apron tension in roll baling machines. 4,414,796., Cl. 56-341.000.

Campbell, Willis R.; and Oellig, Franklin A., to Sperry Corporation. Baling machine with air spring means for maintaining apron tension. 4,414,888., Cl. 100-88.000.

Campillo, Anthony J.; and Lin, Horn-Bond. Method and apparatus for aerosol particle absorption spectroscopy. 4,415,265., Cl. 356-338.000.

Canada, Her Majesty the Queen in right of: *See—*
Tremblay, Meude, 4,415,728., Cl. 528-279.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Ward, Frederick D.; and Denis, Claude, 4,414,838., Cl. 73-1.00B.

Canadian Industrial Innovation Centre/Waterloo: *See—*
Brodie, Don E.; and Morgan, John H., 4,415,602., Cl. 427-39.000.

Canon Kabushiki Kaisha: *See—*
Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643., Cl. 430-94.000.
Hirohata, Michio; and Ogawa, Yukio, 4,415,252., Cl. 354-234.000.
Inoue, Takahiro; Takada, Yusaku; and Aoki, Takao, 4,415,256., Cl. 355-3.0TR.
Itoh, Susumu; and Sawamura, Mitsuharu, 4,415,233., Cl. 350-173.000.
Iwakura, Sadao, 4,415,890., Cl. 340-749.000.
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato. Yasushi, 4,415,920., Cl. 358-37.000.
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924., Cl. 358-50.000.
Konishi, Motofumi, 4,415,934., Cl. 358-294.000.
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, 4,415,886., Cl. 340-618.000.
Nagata, Saburo; and Nara, Ken, 4,415,326., Cl. 434-113.000.
Sugiura, Kenitiro, 4,415,908., Cl. 346-76.0PH.
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,415,248., Cl. 354-43.000.
Tamura, Yasuyuki, 4,415,925., Cl. 358-75.000.
Tazaki, Shigemitsu, 4,415,911., Cl. 346-140.00R.
Tsuzuki, Hiroyoshi; and Tokuda, Ryuji, 4,415,249., Cl. 354-173.000.

Canup, Robert E., to Texaco Inc. Internal combustion engine ignition system with improvement. 4,414,954., Cl. 123-606.000.

Capaccio, Giancarlo; Smith, Francis S.; and Ward, Ian M., to National Research Development Corporation. Process for the continuous production of high modulus filament of polyethylene. 4,415,522., Cl. 264-210.800.

Capolupo, David F., to Timex Corporation. Wristwatch attachment with interchangeable end pieces. 4,414,719., Cl. 24-265.0WS.

Caratsch, Hans P., to Sinter Limited. Solder leveling device having means for vertically guiding printed circuit boards. 4,414,914., Cl. 118-63.000.

Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, to Henkel Kommanditgesellschaft Auf Aktien. Method for the production of micropowders from cellulose ethers or cellulose. 4,415,124., Cl. 241-28.000.

Carl Schleicher & Schuell GmbH & Co. KG: *See*—
Hein, Wolfgang, 4,415,449., Cl. 210-406.000.

Carl-Zeiss-Stiftung: *See*—
Gottlob, Heinz; and Falk, Horst, 4,415,243., Cl. 351-201.000.
Rossmann, Dieter; Donn, Volker; and Ludwig, Christian, 4,415,250., Cl. 354-195.000.

Cariberg, Charles E., to Hughes Tool Company. Slip setting ring. 4,415,193., Cl. 294-102.00A.

Carli, Alvin J., to Alliance Manufacturing Company, Inc., The. Tape drive door operator. 4,414,778., Cl. 49-199.000.

Carme, Anne M., to AEROPOWER Sarl. Aerogenerator having a controlled axis of orientation. 4,415,813., Cl. 290-44.000.

Carmody, Michael A.; and Cognevich, Michael L., to Baker Oil Tools, Inc. Pressure equalizing flapper type safety valve for subterranean wells. 4,415,036., Cl. 166-324.000.

Carnation Company: *See*—
Bos, Kari E. O., 4,415,599., Cl. 426-578.000.

Caron, Bernard G., to AMP Incorporated. Optical waveguide splice. 4,415,232., Cl. 350-96.210.

Carrier Corporation: *See*—
Gratzer, Nelson R.; and Wright, William E., 4,414,834., Cl. 72-58.000.

Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., to Stauffer Chemical Company. Treating the residue from the production of phosphorochloridothionates. 4,415,506., Cl. 260-986.000.

Carson, Robert W. Operating arthroscope. 4,414,962., Cl. 128-6.000.

Cartier, Peter G.: *See*—
Osei-Gyimah, Peter; Cartier, Peter G.; and Ellis, Paul E., 4,415,455., Cl. 210-654.000.

Caruthers, Marvin H.; and Beaucage, Serge L., to University Patents, Inc. Phosphoramidite compounds and processes. 4,415,732., Cl. 536-27.000.

Carver, Robert W. Tuning apparatus and method. 4,415,768., Cl. 381-10.000.

Cascio, Horace E.: *See*—
Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, 4,415,807., Cl. 250-363.00S.

Case, Donald B.: *See*—
McHarrie, John C.; Hopcroft, Peter W.; and Case, Donald B., 4,415,111., Cl. 227-19.000.

Cash, Harry R., Jr.: *See*—
Meighan, Richard M.; and Cash, Harry R., Jr., 4,415,638., Cl. 429-225.000.

Casio Computer Co., Ltd.: *See*—
Mitarai, Tsuyoshi; and Yamaguchi, Takeshi, 4,414,878., Cl. 84-1.190.
Mori, Hiromitsu, 4,415,271., Cl. 368-41.000.

Caskey, Douglas C.; and Chapman, Douglas W., to Mallinckrodt, Inc. Process for preparing p-aminophenol and alkyl substituted p-aminophenol. 4,415,753., Cl. 564-418.000.

Cassar, Luigi: *See*—
Iqbal, Abul; and Cassar, Luigi, 4,415,685., Cl. 524-92.000.

Cassell, Ronald L.; and Hall, Thomas N., to BASF Wyandotte Corporation. Dinitroaniline herbicidal compositions containing freezing point depressant additives. 4,415,355., Cl. 71-121.000.

Cassella Aktiengesellschaft: *See*—
Buhler, Ulrich; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,415,494., Cl. 260-196.000.

Casteel, Jerry F.: *See*—
Chan, Albert F.; and Casteel, Jerry F., 4,415,033., Cl. 166-274.000.

CAV RotoDiesel: *See*—
Bonin, Jean-Claude, 4,414,945., Cl. 123-368.000.

Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Therapeutical method of treating patients with impaired immune system. 4,415,588., Cl. 424-311.000.

Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Use of carnitine and of lower acyl-carnitines in the therapeutic treatment of the pathology of the veins. 4,415,589., Cl. 424-311.000.

Cave, James P.: *See*—
Witt, Enrique R.; Humphrey, William J.; and Cave, James P., 4,415,453., Cl. 210-615.000.

Cavrak, Thomas. Emergency system for mines. 4,415,204., Cl. 299-1.000.

Cawley, Reginald E. Dental chair. 4,415,203., Cl. 297-391.000.

Celanese Corporation: *See*—
Bauer, Barry J., 4,415,701., Cl. 524-612.000.
Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., 4,415,521., Cl. 264-176.00F.
Witt, Enrique R.; Humphrey, William J.; and Cave, James P., 4,415,453., Cl. 210-615.000.

Centurion Safety Products, Inc.: *See*—
Schaefer, Roger W., 4,415,954., Cl. 362-202.000.

Cerberus AG: *See*—
Tar, Domokis, 4,415,806., Cl. 250-339.000.

Ceskoslovenska akademie ved: *See*—
Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, 4,414,905., Cl. 110-245.000.

Chadra, David P., to Burroughs Corporation. Data flow control system. 4,415,986., Cl. 364-900.000.

Chaffin, Fred E.: *See*—
Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., 4,414,870., Cl. 82-36.00R.

Champion International Corporation: *See*—
Benham, Albert A., 4,415,183., Cl. 281-31.000.
Romine, Donnie; and Woodard, Harry L., 4,415,080., Cl. 206-303.000.

Champion Spark Plug Italiana S.p.A.: *See*—
Maiocco, Guiseppe A., 4,414,830., Cl. 70-252.000.

Chan, Albert F.; and Casteel, Jerry F., to Standard Oil Company. Inverse viscosity grading. 4,415,033., Cl. 166-274.000.

Chan, Marie S.: *See*—
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417., Cl. 204-159.240.

Chandler, Carl D., Jr., to Hercules Incorporated. Removal and destruction of residual nitrate esters in wastewater. 4,415,456., Cl. 210-673.000.

Chapman, Douglas W.: *See*—
Caskey, Douglas C.; and Chapman, Douglas W., 4,415,753., Cl. 564-418.000.

Chappell, Anthony G., to Wellcome Australia Limited. Metering pump. 4,415,314., Cl. 417-131.000.

Charkey, Allen, to Energy Research Corporation. Secondary batteries having a zinc negative electrode. 4,415,636., Cl. 429-27.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
De Fazio, Thomas L., 4,414,750., Cl. 33-185.00R.

Chasar, Dwight W., to B. F. Goodrich Company, The. Sterically hindered phenyl bis(naphthyl)phosphites and compositions thereof. 4,415,686., Cl. 524-101.000.

Chatfield, Phillip A.: *See*—
Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832., Cl. 72-8.000.

Chemische Fabrik Stockhausen GmbH: *See*—
Peppmoller, Reinmar, 4,415,472., Cl. 252-321.000.

Chen, Albert C.; and Nagy, Frank A., to Mobil Oil Corporation. Deodorization of N-vinyl monomers. 4,415,468., Cl. 252-182.000.

Chen, Augustin T.; Nelb, Robert G., II; and Onder, Kemal, to Upjohn Company, The. Stabilization of polyesteramides with urethanes. 4,415,693., Cl. 524-198.000.

Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., to Pillsbury Company, The. Method of processing dough to increase its baked specific volume. 4,415,598., Cl. 426-394.000.

Chevron Research Company: *See*—
Madan, Arun, 4,415,760., Cl. 136-258.000.
Nicksic, Stephen W., 4,415,671., Cl. 436-29.000.
Spars, Byron G.; and Santucci, Lawrence E., 4,415,365., Cl. 106-85.000.

Chiang, Robert L., to W. R. Grace & Co. Catalytic cracking catalyst. 4,415,439., Cl. 208-120.000.

Chiba, Hiroshi; and Ogura, Shoichi, to Nippon Electric Co., Ltd.; and Sumitomo Metal Mining Company Limited. Lead frame for integrated circuit devices. 4,415,917., Cl. 357-70.000.

Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, to Tanabe Seiyaku Co., Ltd. p-Hydroxyphenylglycine.α-phenylethanesulfonate, process for production thereof and utilization thereof in resolution of p-hydroxyphenylglycine. 4,415,504., Cl. 260-501.120.

Chloride Silent Power Limited: *See*—
Robinson, Graham; Ansell, Raymond O.; and McNamee, Michael, 4,415,637., Cl. 429-218.000.

Choinski, Edward J., to Polaroid Corporation. Process simulator. 4,415,610., Cl. 427-372.200.

Chollet, Alain: *See*—
Menard, Christian; Marouby, Daniel; and Chollet, Alain, 4,414,804., Cl. 60-39.141.

Cholmar, Sidney, to National Can Corporation. Method and apparatus for uniform corona discharge bonding. 4,415,394., Cl. 156-379.800.

Choustoulakis, Nikitas. Apparatus for dispensing a material into the atmosphere. 4,415,797., Cl. 219-273.000.

Choyce, David P. Intra-ocular lenses. 4,414,694., Cl. 3-13.000.

Christensen, Inc.: *See*—
Jurgens, Rainer, 4,415,316., Cl. 418-48.000.
Jurgens, Rainer, 4,415,823., Cl. 310-87.000.

Chromalloy American Corporation: *See*—
Hadler, Howard D.; and Kreftmeyer, James R., 4,415,043., Cl. 172-776.000.

Chszaniecki, Siegfried: *See*—
Brinkmann, Heinz; and Chszaniecki, Siegfried, 4,415,268., Cl. 366-85.000.

Chu, Wesley W.; and Hibbits, David G., to United States of America, Navy. Multiplexed MOS multiaccess memory system. 4,415,991., Cl. 365-77.000.

Chuang, Shih, to Statek Corporation. Microresonator of tuning fork configuration operating at its second overtone frequency. 4,415,827., Cl. 310-370.000.

Chugai Denki Kogyo K.K.: *See*—
Shibata, Akira, 4,414,742., Cl. 29-882.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.

Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.

Chung, Seun Y. Sanitary pants used for the male. 4,414,971., Cl. 128-159.000.

Church, Victor E., to Telectronics Pty. Ltd. Universal programmer for operating implantable device reed switch. 4,414,978., Cl. 128-419.0PG.

Chyung, Kenneth: *See—*
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,415,672., Cl. 501-4.000.

Ciba-Geigy Corporation: *See—*
Cook, Alasdair M.; and Hutter, Ralf, 4,415,658., Cl. 435-122.000.
Iqbal, Abul; and Cassar, Luigi, 4,415,685., Cl. 524-92.000.
Martin, Henry, 4,415,743., Cl. 549-491.000.

Ciganek, Engelbert; and Shenvi, Ashokkumar B., to Du Pont de Nemours, E. I., and Company. Certain tetrahydropyridine intermediates. 4,415,736., Cl. 546-283.000.

CII Honeywell Bull: *See—*
Guillemet, Michel J.; and Isert, Michel, 4,415,971., Cl. 364-200.000.

Cioca, Gheorge; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, to Seton Company. Moisture vapor permeable sheet materials. 4,415,628., Cl. 428-335.000.

Cities Service Company: *See—*
Bouck, Larry S., 4,415,034., Cl. 166-302.000.
Matyas, Richard S.; and Hamshar, John A., 4,415,431., Cl. 208-8.00R.

Citizen Watch Co., Ltd.: *See—*
Sasanuma, Yasutomo, 4,415,421., Cl. 204-192.00N.

Clabburn, Robin J. T.; and Stroessner, Rolf B., to Raychem Corporation. Cable joining connector and method. 4,415,217., Cl. 339-113.00L.

Clairol Incorporated: *See—*
Kunz, Raymond W., 4,414,963., Cl. 128-60.000.

Clarion Co., Ltd.: *See—*
Hashimoto, Masayuki, 4,415,384., Cl. 148-187.000.

Clark, Charles A., Jr., to Sperry Corporation. Line variable overcurrent protection for a voltage conversion circuit. 4,415,960., Cl. 363-21.000.

Clarke, John W.; and Harris, Dale C., to Eli Lilly and Company. Dry pharmaceutical system. 4,415,085., Cl. 206-526.000.

Clayburn, Randall C.: *See—*
Willis, Donald H.; and Clayburn, Randall C., 4,415,841., Cl. 315-400.000.

Clayton, William J.; and Outhouse, William G., to Mobil Oil Corporation. Laminated pressure sensitive adhesive strip for use in plastic bags. 4,415,087., Cl. 206-632.000.

Cleaver, Laird C.: *See—*
Baron, Walter J.; and Cleaver, Laird C., 4,415,022., Cl. 165-95.000.

Cline, Richard S.: *See—*
Gaskey, Kenneth M.; Gupta, Indra; and Cline, Richard S., 4,415,382., Cl. 148-153.000.

Cmolik, Brian L.: *See—*
Benton, Kenneth C.; Cmolik, Brian L.; and Weinert, Raymond J., 4,415,474., Cl. 502-117.000.

Coates, James H. Sight glass/lens mounting assembly. 4,415,235., Cl. 350-319.000.

Cobden, Kenneth J. Turbine. 4,415,306., Cl. 415-2.00A.

Coca-Cola Company, The: *See—*
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 4,414,768., Cl. 40-584.000.

Coffman, Moody L.; and Bradshaw, Lawrence R., Jr. Waste disposal systems and methods. 4,415,459., Cl. 210-747.000.

Cognevich, Michael L.: *See—*
Carmody, Michael A.; and Cognevich, Michael L., 4,415,036., Cl. 166-324.000.

Colevris, Nick: *See—*
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,415,155., Cl. 273-26.00E.

Colgate Palmolive Company: *See—*
Kiczek, Alexander P.; Salmen, Leo A.; and Tower, Clark B., 4,415,489., Cl. 252-558.000.

Colley, Stephen R.: *See—*
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969., Cl. 364-200.000.

Colling, Edwin L., Jr.: *See—*
Slough, Carlton M.; and Colling, Edwin L., Jr., 4,415,859., Cl. 324-442.000.

Collins, Thomas W.; and Tao, Lung-jo, to International Business Machines Corporation. Magnetic bubble passive replicator. 4,415,987., Cl. 365-12.000.

Collins, Walter W., to Schur, Inc. Knife and sheath. 4,414,744., Cl. 30-151.000.

Colloid Piepho: *See—*
Piepho, Ralf F., 4,415,467., Cl. 252-181.000.

Combustion Engineering, Inc.: *See—*
Delin, Michael A.; and Schuss, Jack A., 4,415,884., Cl. 340-500.000.
Johnson, Walter R., 4,415,674., Cl. 501-104.000.

Commissariat a l'Energie Atomique: *See—*
Lacoste, Jean-Andre; Leveque, Jeaqn-Pierre; and Schley, Robert, 4,415,758., Cl. 136-233.000.
Valiot, Catherine; Lemaire, Francis; and Gaussens, Gilbert, 4,415,603., Cl. 427-54.100.

Compagne Francaise D'Entreprises Minieres, Metallurgiques et D'Investissements: *See—*
Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., 4,415,542., Cl. 423-141.000.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See—*
Bailly, Emile, 4,414,894., Cl. 101-123.000.

Conair, Inc.: *See—*
Boring, Douglas J., 4,415,297., Cl. 406-168.000.

Connell, Michael J.; and Swanson, Ronald L. Map holder. 4,415,106., Cl. 224-221.000.

Conoco Inc.: *See—*
Doerr, Richard E., 4,415,207., Cl. 299-18.000.
Echtler, J. Paul, 4,415,341., Cl. 55-53.000.
Mack, Mark P., 4,415,714., Cl. 526-125.000.

Conrad, Oswald, to Daimler-Benz Aktiengesellschaft. Gas turbine with atomizer nozzle. 4,414,815., Cl. 60-726.000.

Container Corporation of America: *See—*
Hart, Joseph J., 4,415,078., Cl. 206-45.140.

Contal, Francois; and Boyer, Bernard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Temporarily rigidifying soft materials. 4,414,819., Cl. 62-222.000.

Continental Group, Inc., The: *See—*
Newman, Fred C., 4,415,387., Cl. 156-69.000.

Cook, Alasdair M.; and Hutter, Ralf, to Ciba-Geigy Corporation. Process for decomposing 2,4-dihydroxy-6-amino-s-triazine derivatives. 4,415,658., Cl. 435-122.000.

Cook, John W., to Westinghouse Electric Corp. Method and apparatus for automatic mill zero correction for strip width. 4,415,976., Cl. 364-472.000.

Cook, Marvin K.: *See—*
Shah, Nutan B.; and Cook, Marvin K., 4,415,549., Cl. 424-52.000.

Cookson, Alan H., to Westinghouse Electric Corp. Gas-insulated transmission line having improved outer enclosure. 4,415,763., Cl. 174-28.000.

Coone, Joseph H., Jr.: *See—*
Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., 4,415,478., Cl. 502-181.000.

Cooper, Jerry W.: *See—*
Medford, Richard D.; and Cooper, Jerry W., 4,415,389., Cl. 156-91.000.

Cooperrider, Mark W.: *See—*
Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., 4,415,542., Cl. 423-141.000.

Copeland, Robert J.; and Martin, John D., to Vought Corporation. Solar power satellite. 4,415,759., Cl. 136-246.000.

Copening, Ward L., to Dow Chemical Company, The. Lightweight cement slurry and method of use. 4,415,366., Cl. 106-86.000.

Cordell, Ralph L., to Standard Oil Company. Non-polarizing electrode system for geophysical prospecting and the like. 4,415,857., Cl. 324-357.000.

Cornie, James A.: *See—*
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609., Cl. 427-249.000.

Corning Glass Works: *See—*
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,415,672., Cl. 501-4.000.
Frost, Rodney I.; and Montierth, Max R., 4,415,344., Cl. 55-523.000.
Keck, Donald B., 4,415,230., Cl. 350-96.330.

Corsello, Vincent: *See—*
Glass, Michael; Koch, Edwin R.; and Corsello, Vincent, 4,415,593., Cl. 426-4.000.

Cory, Halsey W., to Force Control Industries, Inc. Liquid cooled brake unit. 4,415,067., Cl. 188-71.500.

Cosson, Keith J. Replaceable ripper shoe. 4,415,042., Cl. 172-749.000.

Courtois, James A.: *See—*
Young, Kenneth P.; Kyonka, Curtis P.; and Courtois, James A., 4,415,374., Cl. 148-2.000.

Cozzi, Joseph A. Training aid bell for pets. 4,414,921., Cl. 119-29.000.

Craemer, Robert H.; and Woolston, A. Brent, to Molins Machine Company, Inc. Cut-to-mark cut-off control automated for splice and order change. 4,415,978., Cl. 364-475.000.

Craig, Harold M.; Wagner, Walter B.; and Strock, William J., to United States of America, National Aeronautics and Space Administration. Combustor liner construction. 4,414,816., Cl. 60-757.000.

Craun, Gary P.: *See—*
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417., Cl. 204-159.240.

Creusot-Loire: *See—*
Pere, Gerard, 4,415,424., Cl. 204-257.000.

Croney, David J.: *See—*
Weeks, Ronald D.; and Croney, David J., 4,415,950., Cl. 361-433.000.

Crook, Paul, to Cabot Corporation. Cobalt superalloy. 4,415,532., Cl. 420-585.000.

Crooms, Clarence. Cranial closure. 4,414,720., Cl. 27-21.000.

Crossley, Roger, to John Wyeth and Brother Limited. Pyridine derivatives. 4,415,579., Cl. 424-263.000.

Crossley, Roger; and Dickinson, Kay H., to John Wyeth and Brother Limited. Method of treating ulcers or hypersecretion. 4,415,582., Cl. 424-267.000.

Crouzet: *See—*
Buisson, Raymond, 4,414,735., Cl. 29-879.000.

Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753., Cl. 33-356.000.
Crowley, Norman: *See*—
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,415,325., Cl. 425-397.000.
Crozet, Francois E. G.: *See*—
Bouiller, Jean G.; Crozet, Francois E. G.; and Soligny, Marcel R., 4,415,310., Cl. 416-95.000.
Csathy, Denis G.; and Krowech, Robert J., to Deltak Corporation. Heat recovery boiler for high pressure gas. 4,414,923., Cl. 122-7.00R.
Curth, Claus P.; Tiemens, Ulf; and Klotz, Erhard, to U.S. Philips Corporation. Device for forming images of layers of a three-dimensional object by superposition zonograms. 4,416,018., Cl. 378-2.000.
Curtis, Nikolaus A.; and Renshaw, Carroll M. Cylinder deactivation device with slotted sleeve mechanism. 4,414,935., Cl. 123-198.00F.
Cusano, Dominic A.; and DiBianca, Frank A., to General Electric Company. Scintillation detector array employing zig-zag plates. 4,415,808., Cl. 250-367.000.
Cutter, David; and Unterberger, Hans, to Siemens Aktiengesellschaft. Multi-purpose terminal device having an input and control keyboard for connection to a data processing system and/or to an automatic text processing unit. 4,415,981., Cl. 364-518.000.
Cutter, James W., to Litton Industrial Products, Inc. Prism light-line system. 4,416,022., Cl. 378-206.000.
Cynkar, Thomas E.; and House, James G., to NCR Corporation. Method of reworking upper metal in multilayer metal integrated circuits. 4,415,606., Cl. 427-90.000.
Czulak, Jozeph; and Hammond, Leslie A., to Australian Diary Corporation. Manufacture of cheese. 4,415,594., Cl. 426-36.000.
Daicel Chemical Industries, Ltd.: *See*—
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,415,703., Cl. 525-54.210.
Toga, Yuzo; Shimada, Toshio; and Okamoto, Ichiro, 4,415,727., Cl. 528-272.000.
Yabune, Hideo; and Uchida, Manabu, 4,415,734., Cl. 536-76.000.
Dailey, George F.; and Kauric, Charles E., to Westinghouse Electric Corp. End turn bracing with locking and alignment device. 4,415,825., Cl. 310-270.000.
Daimler-Benz Aktiengesellschaft: *See*—
Conrad, Oswald, 4,414,815., Cl. 60-726.000.
Daisley, Richard J.; and Ring, Lawrence S., to Sybron Corporation. Orthodontic bracket assembly. 4,415,330., Cl. 433-16.000.
Daly, William T.; Gelman, Boris; and Sanderson, William R., to Telex Communications, Inc. Automatic focusing system. 4,415,244., Cl. 353-101.000.
Dammann, Peter; Schippers, Heinz; and Bauer, Karl, to Barmag Barmer Maschinenfabrik AG. False twisting apparatus. 4,414,803., Cl. 57-340.000.
Dana Corporation: *See*—
Campbell, Chris A.; and Overbeek, Robert B., 4,415,073., Cl. 192-54.000.
McKinney, Joe R.; and Swagger, Roy G., 4,415,378., Cl. 148-12.100.
Daniels, Kenneth M. Collapsible rebound exercise device. 4,415,151., Cl. 272-65.000.
Dareing, Donald W.: *See*—
Rehm, William A.; Dareing, Donald W.; and Wood, Edward T., 4,415,205., Cl. 299-5.000.
Dasting, Klaus: *See*—
Nagel, Gerhard; and Dasting, Klaus, 4,414,864., Cl. 81-3.00R.
Daugherty, James B.; and Balash, Frederick A., to Rogers Corporation. Keyboard with edge vent. 4,415,780., Cl. 200-5.00A.
Daugirda, Paul G., to Rheem Manufacturing Company. Vessel construction employing multiple internal heat exchange tubes. 4,415,020., Cl. 165-76.000.
Daumer, Rolf; Klotzner, Winfried; and Schenk, Manfred, to Robert Bosch GmbH. Control system for an operating event in a vehicular power train. 4,414,946., Cl. 123-417.000.
Dauvergne, Jean L. R. Power-assisted steering device. 4,414,883., Cl. 91-467.000.
Davey, Ernest A.: *See*—
Hidler, Henry T.; Hope, Lawrence L.; and Davey, Ernest A., 4,415,427., Cl. 204-298.000.
Davis, Charles L.: *See*—
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 4,414,768., Cl. 40-584.000.
Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 1-[3-6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-4-hydroxy-4-phenylpiperidines to treat psychoses. 4,415,581., Cl. 424-267.000.
Davis, Steven B., to Westinghouse Electric Corp. Weatherproof terminal cover. 4,415,044., Cl. 174-138.00F.
Davis, Vincent L.; and Smith, Raymond J. D., to General Electric Company. Scintillator screen method of manufacture. 4,415,605., Cl. 427-65.000.
Davis, William J., to RCA Corporation. Raster-scanned CRT display system with improved positional resolution for digitally encoded graphics. 4,415,889., Cl. 340-728.000.
Dawn Designs, Inc.: *See*—
Payne, Rex E., Jr., 4,415,180., Cl. 280-650.000.
Dayco Corporation: *See*—
Medford, Richard D.; and Cooper, Jerry W., 4,415,389., Cl. 156-91.000.
Wetzel, Robert E., 4,415,397., Cl. 156-446.000.
de la Burde, Roger Z.: *See*—
Utsch, Francis V.; de la Burde, Roger Z.; Aument, Patrick E.; and Merritt, Henry B., 4,414,987., Cl. 131-296.000.
Dean, Robert R.; Letzsch, Warren S.; and Mauleon, Jean L. Method for catalytically converting residual oils. 4,415,438., Cl. 208-120.000.
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., to Avco Corporation. Method of applying a carbon-rich surface layer to a silicon carbide filament. 4,415,609., Cl. 427-249.000.
de Castro, Aurora F.; and Gupta, Surendra K., to TechAmerica Group, Inc. Electrophoretic separation of isoenzymes utilizing a stable polyacrylamide system. 4,415,655., Cl. 435-17.000.
Decker, Harry J.; and Thorsteinson, Erlind M., to Union Carbide Corporation. Process for preparing unsaturated acids with Mo, V, Nb, Fe-containing catalysts. 4,415,752., Cl. 562-534.000.
De Cuester, Robert J. M.; Hoeben, Louis J. M.; and Wood, Clair, to GTE Products Corporation. Lamp with improved fuse wire. 4,415,836., Cl. 315-50.000.
Dedreuil-Monnet, Louis: *See*—
Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753., Cl. 33-356.000.
Deere & Company: *See*—
Gauer, Larry C., 4,415,052., Cl. 180-69.00R.
Heino, Dean L., 4,414,863., Cl. 74-866.000.
Kainer, Carl E., 4,415,175., Cl. 280-460.00A.
Meyer, Raymond J., 4,415,197., Cl. 296-216.000.
Riedinger, Franz W., 4,414,794., Cl. 56-16.600.
Deering, Kenneth J., to Marine Construction & Design Co. Net hauling sheave device with tailing pressure wheel. 4,415,140., Cl. 254-371.000.
Dees, John R.: *See*—
Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,414,801., Cl. 57-288.000.
De Fazio, Thomas L., to Charles Stark Draper Laboratory, Inc., The. Single stage remote center compliance device. 4,414,750., Cl. 33-185.00R.
Degenhardt, Heinz, to Siemens Aktiengesellschaft. X-Ray fluorescent screens. 4,415,471., Cl. 252-301.360.
Degussa Aktiengesellschaft: *See*—
Martens, Jurgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738., Cl. 548-147.000.
Voigt, Carl; Kleinschmit, Peter; and Manner, Reinhard, 4,415,485., Cl. 502-100.000.
Del Mar Avionics: *See*—
Wong, Alan S.; Karwan, Mitchell S.; and Germane, Keith L., 4,414,981., Cl. 128-712.000.
Delfino, Michelangelo; and Reifsteck, Timothy, to Fairchild Camera and Instrument Corporation. Laser scanning method for annealing, glass flow and related processes. 4,415,794., Cl. 219-121.0LM.
D'Elia, Conrad A., to Trustee for David Roth. Base fabric for the manufacture of embroidery and lace and method of its preparation. 4,415,617., Cl. 428-86.000.
Delin, Michael A.; and Schuss, Jack A., to Combustion Engineering, Inc. Diagnostic circuit for programmable logic safety control systems. 4,415,884., Cl. 340-500.000.
Deltak Corporation: *See*—
Csathy, Denis G.; and Krowech, Robert J., 4,414,923., Cl. 122-7.00R.
DeLuzio, Reno A.: *See*—
Matthews, James B.; and DeLuzio, Reno A., 4,415,266., Cl. 356-350.000.
Demuth, Martin; and Schaffner, Kurt, to Studiengesellschaft Kohle mbH. Pure enantiomers of bicyclo[2.2.2]oct-5-en-2-ones, processes for their production and their use. 4,415,756., Cl. 568-365.000.
Denes, Oscar L.; Kiphart, Lynn R.; and Szalewski, Paul P., to Allen-Bradley Company. Method of manufacturing printed circuit network devices. 4,415,607., Cl. 427-96.000.
Denis, Claude: *See*—
Ward, Frederick D.; and Denis, Claude, 4,414,838., Cl. 73-1.00B.
Dennison Manufacturing Company: *See*—
Pitts, Warren R., 4,415,946., Cl. 361-212.000.
Dentronix Systems, Inc.: *See*—
Knoll, Peter R., 4,415,136., Cl. 248-181.000.
Dentsply Research & Development Corp.: *See*—
Rudler, Helmut; and Williams, Ralph J., 4,414,998., Cl. 137-216.000.
DePillo, Lawrence V., to Mark Eyelet & Stamping, Inc. Connector receptacle for printed circuit boards. 4,415,212., Cl. 339-17.00C.
Derossi, Piero M. Device for the correction of an error in the electric transmission of an indication. 4,414,752., Cl. 33-320.000.
Devaud, Gerard L., to Societe d'Applications des Machines Motrices. Hydraulic control device. 4,414,881., Cl. 91-216.00R.
Development & Finance Limited: *See*—
Steele, Ronald, 4,414,727., Cl. 29-401.100.
Dewan, Shashi B., to Marathon Electric. Wound rotor motor apparatus. 4,415,846., Cl. 318-732.000.
de Weck, Alain L.; Schneider, Conrad H.; and Rolli, Hans P., to de Weck, Alain L.; and Institut fur Immunologie Inselspital. Lysine polymers which may be used as supports for the preparation of products of diagnosis and products obtained. 4,415,492., Cl. 260-112.50R.
Diamond, Julius; Morgan, Thomas K., Jr.; and Wohl, Ronald A., to Berlex Laboratories, Inc. Method of use of antiarrhythmic 1-arylcarbamoylalkyl imidazole derivatives, composition. 4,415,587., Cl. 424-273.00R.
Diamond Shamrock Corporation: *See*—
Schick, Martin J.; and Knitter, Kathy A., 4,415,338., Cl. 44-51.000.

Dias, Francisco J.: *See*—
Luhleich, Hartmut; and Dias, Francisco J., 4,415,632., Cl. 428-408.000.

Diaz, Nils J.; and Dugan, Edward T., to University of Florida. Heterogeneous gas core reactor. 4,415,525., Cl. 376-317.000.

DiBianca, Frank A.: *See*—
Cusano, Dominic A.; and DiBianca, Frank A., 4,415,808., Cl. 250-367.000.

Dickhudt, Eugene A.; and Paulson, Roger A., to Medtronic, Inc. Biomedical stimulation lead. 4,414,986., Cl. 128-785.000.

Dickinson, Kay H.: *See*—
Crossley, Roger; and Dickinson, Kay H., 4,415,582., Cl. 424-267.000.

Dickson, LeRoy D., to International Business Machines Corporation. Holographic scanner disc with different facet areas. 4,415,224., Cl. 350-3.710.

Diddens, Paul A., to Honeywell Inc. Gray tone recorder. 4,415,913., Cl. 346-154.000.

Diener, Erwin; and Diner, Uriel, to University of Alberta, The Governors of The. Composition for establishing immunological tolerance. 4,415,552., Cl. 424-91.000.

Diesch, Bradford J.; and Fritts, Rex E., to Raytheon Company. Microwave oven temperature probe control. 4,415,790., Cl. 219-10.55B.

Diesel Kiki Co., Ltd.: *See*—
Nakamura, Hisashi, 4,414,947., Cl. 123-446.000.
Okazaki, Michio, 4,415,321., Cl. 418-179.000.
Shibuya, Tsunenori, 4,415,315., Cl. 417-269.000.

Dietrich, David E. Swirl mixing device. 4,415,275., Cl. 366-165.000.

Dijkmans, Eise C.; and van de Plassche, Rudy J., to U.S. Philips Corporation. Electronic switch. 4,415,815., Cl. 307-243.000.

Dilley, David R.; Lee, Julian J. L.; and Saltveit, Mikal E., Jr., to Board of Trustees, a Constitutional corporation operating Michigan State University. Gas sensing apparatus and method. 4,414,839., Cl. 73-23.000.

Diner, Uriel: *See*—
Diener, Erwin; and Diner, Uriel, 4,415,552., Cl. 424-91.000.

Dischert, Robert A., to RCA Corporation. Television display with doubled horizontal lines. 4,415,931., Cl. 358-242.000.

Discovision Associates: *See*—
Jarsen, Manfred H., 4,415,138., Cl. 249-114.00R.

Dispersa AG: *See*—
Gamba, Giancesare; and Bonomi, Luciano, 4,415,564., Cl. 424-244.000.

Doane, Robert E.: *See*—
Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., 4,415,542., Cl. 423-141.000.

Dobrozemsky, Jaroslav: *See*—
Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, 4,414,905., Cl. 110-245.000.

Dr. Franz Kohler Chemie GmbH: *See*—
Bretschneider, Hans-Jurgen, 4,415,556., Cl. 424-153.000.

Dr. Madaus & Co.: *See*—
Beck, Jurgen; and Rohrig, Herbert, 4,415,811., Cl. 250-560.000.

Dr. Werner Herdieckerhoff, Firma: *See*—
Herdieckerhoff, Rainer, 4,415,145., Cl. 266-253.000.

Dodd, Murray B. Wax-encased butane safety candle. 4,415,329., Cl. 431-125.000.

Dodge, John H.; and Ernst, Larry M., to International Business Machines Corporation. Method and apparatus for monitoring and controlling heated fusers for copiers. 4,415,800., Cl. 219-497.000.

Doerr, Richard E., to Conoco Inc. Underspoil slurry haulage. 4,415,207., Cl. 299-18.000.

Donn, Volker: *See*—
Rossmann, Dieter; Donn, Volker; and Ludwig, Christian, 4,415,250., Cl. 354-195.000.

D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., to Miles Laboratories, Inc. Enzyme electrode membrane. 4,415,666., Cl. 435-179.000.

Dorius, Lee: *See*—
Hull, Maury L.; and Dorius, Lee, 4,415,176., Cl. 280-612.000.

Dorrestijn, Antoon; Lemstra, Pieter J.; and van Unen, Lambert H. T., to Stamicarbon B.V. Method for the preparation of rigid polyvinyl chloride foams. 4,415,514., Cl. 264-53.000.

Dotson, Robert S.; Richeson, W. George; and Trenka, Herb M., to General Conveyors Limited. Microsurgical knife. 4,414,974., Cl. 128-305.000.

Douglas, Jack E., to Arthur Shaw Manufacturing Company. Friction stay with resilient coupling for windows. 4,414,706., Cl. 16-370.000.

Douglas, Richard: *See*—
Lai, Juey H.; Douglas, Richard; and Shepherd, Lloyd, 4,415,653., Cl. 430-296.000.

Dow Chemical Company, The: *See*—
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,415,691., Cl. 524-114.000.
Blanchard, Robert R.; and Bourne, Tommy R., 4,415,707., Cl. 525-231.000.
Copening, Ward L., 4,415,366., Cl. 106-86.000.
Jernigan, Robert T., 4,414,817., Cl. 60-641.200.
Kernstock, John M., 4,415,683., Cl. 524-43.000.
Lane, George A.; and Rossow, Harold E., 4,415,466., Cl. 252-70.000.
Lee, John M.; and Bauman, William C., 4,415,677., Cl. 521-28.000.
Lee, John M.; and Bauman, William C., 4,415,678., Cl. 521-28.000.
Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., 4,415,463., Cl. 252-8.55R.
Nelson, Erik B., 4,415,367., Cl. 106-89.000.
Shipley, Randall S.; and Freyer, Larry E., 4,415,712., Cl. 526-122.000.
Small, Hamish; and Miller, Theodore E., Jr., 4,414,842., Cl. 73-61.10C.
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, 4,415,502., Cl. 260-463.000.

Dresser Industries, Inc.: *See*—
Fertl, Walter H.; and Oliver, Donald W., 4,415,805., Cl. 250-260.000.
Flagg, Jack J., 4,415,895., Cl. 340-856.000.
Walkow, Arnold M.; and Linyaev, Eugene J., 4,415,030., Cl. 166-241.000.

Dressler, Daryl D.; and Fiala, Jimmy L., to Minnesota Mining and Manufacturing Company. Switching circuitry for load control utilizing MOS-FETs. 4,415,894., Cl. 340-825.570.

Driver, R. Byron, to Universal Data Systems, Inc. Line powered modem automatic answer device powered from equipment. 4,415,774., Cl. 179-2.0DP.

Drogichen, Daniel P.: *See*—
Gryger, Dana A.; and Drogichen, Daniel P., 4,415,984., Cl. 364-900.000.

Dror, Yaakov: *See*—
Manassen, Joost; and Dror, Yaakov, 4,415,500., Cl. 260-429.00R.

Drutchas, Gilbert H., to TRW Inc. Steering gear. 4,415,054., Cl. 180-79.100.

Dry Dock Industries, Inc.: *See*—
Smith, Jon D.; and Parker, Glenn T., 4,415,299., Cl. 411-340.000.

Dryczynski, Kurt; Schadlich, Gunther; and Moraw, Roland, to Hoechst Aktiengesellschaft. Method and apparatus for electrostatically charging a dielectric layer. 4,415,947., Cl. 361-235.000.

DSO "Pharmachim": *See*—
Zhabilov, Harry P.; and Karavassileff, Todor Y., 4,415,553., Cl. 424-95.000.

Dubauskas, Thomas A., to Lewis Engineering Company, The. Combination analog-digital indicator. 4,415,855., Cl. 324-114.000.

Dubeck, Michael: *See*—
Hargis, Duane C.; and Dubeck, Michael, 4,415,749., Cl. 560-232.000.

Dublin, Wilbur L., Jr.; and Schrenkel, Jack, to Schrenkel, Jack, a part interest. Gas well monitoring device. 4,414,846., Cl. 73-151.000.

Dugan, Edward T.: *See*—
Diaz, Nils J.; and Dugan, Edward T., 4,415,525., Cl. 376-317.000.

Duijkers, Peter A., to U.S. Philips Corporation. Sawtooth generator switchable between a free-running state or a synchronizable state. 4,415,869., Cl. 331-111.000.

Duncan, Samuel E. Top water fishing lure. 4,414,772., Cl. 43-42.360.

Du Pont de Nemours, E. I., and Company: *See*—
Ciganek, Engelbert; and Shenvi, Ashokkumar B., 4,415,736., Cl. 546-283.000.
Grot, Walther G., 4,415,679., Cl. 521-31.000.
Lawrence, Frederick R., 4,415,754., Cl. 564-423.000.
Long, George R., 4,415,802., Cl. 235-382.000.
Martin, Jose V., 4,414,916., Cl. 118-612.000.
Munger, Stanley H.; Short, Michael R.; and Swatton, David W., 4,415,649., Cl. 430-271.000.
Proskow, Stephen, 4,415,651., Cl. 430-277.000.
Proskow, Stephen, 4,415,652., Cl. 430-277.000.

Durbin, John A.: *See*—
Rees, James D.; and Durbin, John A., 4,415,258., Cl. 355-8.000.

Durenec, Peter, to United States of America, Army. Cryogenic cooler adapter plate. 4,414,824., Cl. 62-295.000.

Durette, Philippe L., to Merck & Co., Inc. Process for the preparation of methyl 2,6-dideoxy-α-D-arabino-hexopyranoside. 4,415,731., Cl. 536-18.400.

Durkan, Gerald, to Tritec Industries, Inc. Apneic event detector and method. 4,414,982., Cl. 128-716.000.

Dusenbury, Joseph H.; and McBride, Daniel T., to Milliken Research Corporation. Process for chemically sculpturing wool pile fabrics. 4,415,331., Cl. 8-114.600.

Duskin Franchise Kabushiki Kaisha: *See*—
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,415,620., Cl. 428-157.000.

Dusza, Robert J.: *See*—
Bard, George D.; and Dusza, Robert J., 4,414,872., Cl. 83-171.000.

Dyakonov, Alexandr J.: *See*—
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477., Cl. 502-178.000.

Dynamics Research Corporation: *See*—
Bakewell, Joseph J., 4,415,403., Cl. 156-634.000.

Dzierson, Mark A.; and Dzierson, William V., Sr., to Elmer Little & Sons, Inc. Drinking glove. 4,414,692., Cl. 2-160.000.

Dzierson, William V., Sr.: *See*—
Dzierson, Mark A.; and Dzierson, William V., Sr., 4,414,692., Cl. 2-160.000.

E.C.H. Will (GmbH & Co.): *See*—
Besemann, Alfred; and Rehwald, Willi, 4,414,873., Cl. 83-311.000.

Eastin, Roger M.: *See*—
Mishra, Amarendra; Speros, Dimitri M.; and Eastin, Roger M., 4,415,835., Cl. 313-627.000.

Eastman Kodak Company: *See*—
Baumeister, Hans P. A., 4,415,840., Cl. 315-323.000.
Harvey, Donald M., 4,415,245., Cl. 354-25.000.
Hasenauer, Charles R.; and Miller, Donald N., 4,415,626., Cl. 428-323.000.
Henry, James W., 4,415,926., Cl. 358-107.000.

Klein, Gerald W.; and Bowman, Wayne A., 4,415,647., Cl. 430-213.000.
Meyers, John J., 4,415,234., Cl. 350-310.000.
Potts, P. Keith, 4,415,139., Cl. 251-62.000.
Specht, Donald P.; and Thomas, Harold T., 4,415,621., Cl. 428-172.000.

Ebata, Sadao, to Kawasaki Steel Corporation. Continuous hardening device of steel plate. 4,415,143., Cl. 266-112.000.

Eber, David H.: *See*—
Butterworth, Arthur L.; and Eber, David H., 4,415,318., Cl. 418-55.000.

Ebisu, Kouji: *See*—
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958., Cl. 126-450.000.

Ebner, Helmut: *See*—
Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, 4,415,642., Cl. 430-86.000.

Ebner, Jerry R., to Monsanto Company. Oxidation and ammoxidation catalyst. 4,415,482., Cl. 502-205.000.

Echtler, J. Paul, to Conoco Inc. Gas, liquid contactor. 4,415,341., Cl. 55-53.000.

Eckel, John A. Quick hardening icing composition. 4,415,601., Cl. 426-659.000.

Eddy, Arthur R., Jr.: *See*—
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666., Cl. 435-179.000.

Edmondson, Morris S.: *See*—
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,415,691., Cl. 524-114.000.

Edwards, Dean B.: *See*—
Rippel, Wally E.; and Edwards, Dean B., 4,415,963., Cl. 363-135.000.

Edwards, Linton A. Control system and shaft seal for Stirling cycle machine. 4,415,171., Cl. 277-12.000.

Efamol Limited: *See*—
Horrobin, David F., 4,415,554., Cl. 424-145.000.

EG & G Sealol, Inc.: *See*—
Johnson, Norman E., 4,415,164., Cl. 277-1.000.

Egami, Tsuneyuki: *See*—
Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, 4,414,847., Cl. 73-204.000.

Ego, Toyokazu: *See*—
Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, 4,415,509., Cl. 264-1.300.

Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, to Janome Sewing Machine Co. Ltd. Suturing machine for medical treatment. 4,414,908., Cl. 112-169.000.

Eichkorn, Franz, to Fritz Pollems Kommanditgesellschaft. Deep vibrator apparatus and method of use. 4,415,046., Cl. 175-56.000.

Eidenschink, Rudolf; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline fluorine-containing cyclohexylbiphenyls and dielectrics and electro-optical display elements based thereon. 4,415,470., Cl. 252-299.630.

Eisai Co., Ltd.: *See*—
Koide, Atsushi; and Yoshizawa, Masayuki, 4,415,667., Cl. 435-212.000.
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567., Cl. 424-246.000.
Suzuki, Suguru; Sano, Noritoshi; and Tajima, Tetsuya, 4,415,559., Cl. 424-183.000.

Eisemann, Kurt, to U.S. Philips Corporation. Braking device for the cover of a chamber in a recording and/or reproducing apparatus. 4,415,069., Cl. 188-82.840.

Electric Power Research Institute: *See*—
Ponder, Jonathan Z., 4,415,762., Cl. 174-28.000.

Electric Power Research Institute, Inc.: *See*—
Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., 4,415,629., Cl. 428-375.000.

Eli Lilly and Company: *See*—
Clarke, John W.; and Harris, Dale C., 4,415,085., Cl. 206-526.000.
Greene, James M., 4,415,751., Cl. 562-478.000.

Ellis, Paul E.: *See*—
Osei-Gyimah, Peter; Cartier, Peter G.; and Ellis, Paul E., 4,415,455., Cl. 210-654.000.

Ellis, Robert W.: *See*—
Engstrom, John H.; and Ellis, Robert W., 4,415,349., Cl. 65-137.000.

Elmberg, Dwayne R., to Sundstrand Corporation. Sliding disc transducer actuator. 4,415,782., Cl. 200-6.00A.

Elmer Little & Sons, Inc.: *See*—
Dzierson, Mark A.; and Dzierson, William V., Sr., 4,414,692., Cl. 2-160.000.

Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, to International Standard Electric Corporation. Electrophotographic member of Se-Te-As with halogen. 4,415,642., Cl. 430-86.000.

Ely, Timothy B.: *See*—
Finck, Frederick P., Jr.; and Ely, Timothy B., 4,415,190., Cl. 292-256.600.

Emmenthal, Klaus-Dieter; Schafer, Otto; and Strozyk, Rudolf-Helmut, to Volkswagenwerk Aktiengesellschaft. Device for continuous injection of a mixture consisting of fuel and air into the intake line (or manifold) of an internal combustion engine. 4,414,944., Cl. 123-339.000.

Endo, Takuya, to Nissan Motor Co., Ltd. Vehicle cabin spot heater. 4,415,118., Cl. 237-12.30A.

Energy Development Associates, Inc.: *See*—
Galloway, James H., 4,415,847., Cl. 320-2.000.

Energy Research Corporation: *See*—
Charkey, Allen, 4,415,636., Cl. 429-27.000.

Engel, Douglas A., to General Symmetrics, Inc. Puzzle. 4,415,158., Cl. 273-153.00S.

Engel, Robert F.; Long, Thomas E.; and Warrington, Ralph M., to Shell Oil Company. Offshore platform free of marine growth and method of reducing platform loading and overturn. 4,415,293., Cl. 405-216.000.

Engelhardt, Gerald J. Ball and target. 4,415,154., Cl. 273-26.00A.

Englert, Norbert: *See*—
Mista, Kresimir; and Englert, Norbert, 4,414,826., Cl. 66-207.000.

English, George J.: *See*—
Rothwell, Harold L., Jr.; English, George J.; and Keeffe, William M., 4,415,829., Cl. 313-621.000.

Engstrom, John H.; and Ellis, Robert W., to Owens-Illinois, Inc. Method and apparatus for cooling glass furnace forehearth. 4,415,349., Cl. 65-137.000.

Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, to Nippon Shinyaku Co. Ltd. Nicotinic acid derivatives. 4,415,570., Cl. 424-249.000.

Enomoto, Ryo: *See*—
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,415,535., Cl. 422-143.000.

Ensco, Inc.: *See*—
Hernandez, Walter C., 4,415,979., Cl. 364-508.000.

Epperson, Bonnie J.; Burnett, Lowell J.; and Helm, Verne D., to UOP Inc. Continuous production of polymethylpentene membranes. 4,415,608., Cl. 427-244.000.

Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, to Variable Speech Control Company ("VSC"). The. Gapless splicing of pitch altered waveforms. 4,415,772., Cl. 369-60.000.

Epstein, Harry, to Kastar, Inc. Autombile fuse puller and combination circuit tester. 4,414,698., Cl. 7-170.000.

Erapolku, Pertti J.: *See*—
Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapolku, Pertti J., 4,415,659., Cl. 435-161.000.

Ericsson, Sylve J. D., to Svecia Silkscreen Maskiner AB. Drying device intended for drying material bearing print issuing from a printing machine. 4,414,755., Cl. 34-4.000.

Erlanson, William J.: *See*—
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417., Cl. 204-159.240.

Ernst, Larry M.: *See*—
Dodge, John H.; and Ernst, Larry M., 4,415,800., Cl. 219-497.000.

Escher Wyss Limited: *See*—
Guttinger, Heinz, 4,414,889., Cl. 100-162.00B.

Esmay, Donald L.; Johnson, Gordon G.; and Vesley, George F., to Minnesota Mining and Manufacturing Co. Cellular pressure-sensitive adhesive product and method of making. 4,415,615., Cl. 428-40.000.

Esselte Pendaflex Corporation: *See*—
Nagel, Gerhard; and Dasting, Klaus, 4,414,864., Cl. 81-3.00R.

Essex Chemical Corporation: *See*—
Laauwe, Robert H., 4,415,122., Cl. 239-327.000.

Estruch, Jose, to Fabrilmalla, Inc. Reversible bathing garment. 4,414,691., Cl. 2-67.000.

Etablissements Francois Salomon & Fils: *See*—
Salomon, Georges P. J.; and Leveque, Alain, 4,414,762., Cl. 36-117.000.

Ethyl Corporation: *See*—
Hargis, Duane C.; and Dubeck, Michael, 4,415,749., Cl. 560-232.000.

Ethyl Products Company: *See*—
Ostrowsky, Efrem M., 4,414,705., Cl. 16-225.000.

Ettenberg, Michael: *See*—
Botez, Dan; and Ettenberg, Michael, 4,416,012., Cl. 372-45.000.

Euteneuer, Charles L., to Pako Corporation. Slide mount data printer. 4,415,282., Cl. 400-30.000.

Evana Tool & Engineering Inc.: *See*—
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,415,325., Cl. 425-397.000.

Evans, Colin, to International Computers Limited. Array processor with stand-by for replacing failed section. 4,415,973., Cl. 364-200.000.

Evans, David: *See*—
Pickering, John F.; and Evans, David, 4,415,070., Cl. 188-264.00F.

Evans, Jeffrey L., to Ting Enterprises, Inc. Fireplace and stove apparatus. 4,414,957., Cl. 126-121.000.

Evans, John M.; and Gilroy, Keith, to Evans, John M.; and Smiths Industries Public Limited Company. Medico-surgical instruments. 4,414,983., Cl. 128-747.000.

Evans, Leah G.: *See*—
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.

Evans, Robert J.: *See*—
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979., Cl. 128-419.00F.

Ex-Cell-O Corporation: *See*—
Ridley, Robert R., 4,414,729., Cl. 29-159.200.

Exxon Research and Engineering Co.: *See*—
Grenoble, Dane C.; and Murrell, Lawrence L., 4,415,437., Cl. 208-120.000.

Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,415,426., Cl. 204-290.00R.
Klein, Robert R.; and Makowski, Henry S., deceased, 4,415,709., Cl. 525-344.000.
Lewis, William E., 4,415,435., Cl. 208-65.000.
Markley, Gerald E.; and Winter, William E., 4,415,441., Cl. 208-138.000.
Murphy, Martin A., 4,415,443., Cl. 208-355.000.
Murrell, Lawrence L.; and Grenoble, Dane C., 4,415,480., Cl. 502-242.000.
Ryu, Ji-Yong; and Brownstein, Arthur M., 4,415,745., Cl. 560-25.000.

EZ Paintr Corporation: *See*—
Burns, Fredrick B., 4,414,700., Cl. 15-105.000.

Fabrilmalla, Inc.: *See*—
Estruch, Jose, 4,414,691., Cl. 2-67.000.

Face, Samuel A., Jr.; and Face, Samuel A., III. Surface deviation measuring device. 4,414,747., Cl. 33-174.00P.

Face, Samuel A., III: *See*—
Face, Samuel A., Jr.; and Face, Samuel A., III, 4,414,747., Cl. 33-174.00P.

Fackler, Charles K., to M & W Gear Company. Minimum till rotary hoe. 4,415,041., Cl. 172-551.000.

Fagan, John L.: *See*—
Smith, Philip C.; and Fagan, John L., 4,415,993., Cl. 365-184.000.

Fagersta AB: *See*—
Borking, Lars-Olof; and Bernstein, Ragnar, 4,415,119., Cl. 237-19.000.

Faiella, James, to Kaepa, Inc. Air-cushion insole. 4,414,760., Cl. 36-29.000.

Fair, Rickey F.; and Wilcox, John R., to Top Shelf Company, Inc. Shelf for a range. 4,414,959., Cl. 126-332.000.

Fairchild Camera and Instrument Corporation: *See*—
Delfino, Michelangelo; and Reifsteck, Timothy, 4,415,794., Cl. 219-121.0LM.

Falk Corporation, The: *See*—
Witt, Ronald A., 4,414,861., Cl. 74-606.00A.

Falk, Horst: *See*—
Gottlob, Heinz; and Falk, Horst, 4,415,243., Cl. 351-201.000.

Falk, Kastelic, Heartwell, Inc.: *See*—
Kastelic, Frank M., Jr., 4,415,189., Cl. 292-196.000.

Fan, You-Ling, to Union Carbide Corporation. Method of preparing water-borne colloidal dispersions of vinyl resins. 4,415,698., Cl. 524-521.000.

Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., to Stauffer Chemical Company. Method of increasing the yield of legumes utilizing O,O-dialkyl dithiophosphoryl acetyl-N-alkyl glycine amides. 4,415,351., Cl. 71-87.000.

Fang, Florence S., to Gillette Company, The. Bioerodible deodorant. 4,415,551., Cl. 424-65.000.

Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. 3-Thiovinylcephalosporins and pharmaceutical compositions. 4,415,562., Cl. 424-246.000.

Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. 3-Formylmethyl-cephalosporins. 4,415,735., Cl. 544-22.000.

Farino, Frank G.; and Jacoby, Richard P., to Jacoby, Richard P. Post-operative toe protector device. 4,414,964., Cl. 128-81.00R.

Farmer, Paul L.: *See*—
Gibeau, Frank C.; and Farmer, Paul L., 4,415,941., Cl. 360-106.000.

Farmland Foods, Inc.: *See*—
Sauvago, Phillip J., 4,414,708., Cl. 17-1.00R.

Fasse, Mark E.; and Glesmann, Herbert C., to Pathfinder Systems, Inc. Automatic guidance mechanism. 4,414,903., Cl. 104-244.100.

Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., to RCA Corporation. Electron multiplier having an improved planar utlimate dynode and planar anode structure for a photomultiplier tube. 4,415,832., Cl. 313-533.000.

Faure, Michel: *See*—
Messe, Gerard; and Faure, Michel, 4,415,874., Cl. 336-178.000.

Fay, Robert F.: *See*—
Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., 4,414,715., Cl. 24-283.000.

Feagin, Roy C., to Remet Corporation. Refractory material. 4,415,673., Cl. 501-102.000.

Feeley, George F.: *See*—
Cioca, Gheorge; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628., Cl. 428-335.000.

Feldman, Gary, to Baxter Travenol Laboratories, Inc. Voltage regulator. 4,415,843., Cl. 318-139.000.

Ferrell, Robert A.; and Robinette, James A., to KCL Corporation; and Strong-Robinette Company, Inc. Method and apparatus for assembling and attaching zipper closure strips to sacks. 4,415,386., Cl. 156-64.000.

Fertl, Walter H.; and Oliver, Donald W., to Dresser Industries, Inc. Method and apparatus for evaluating multiple stage fracturing or earth formations surrounding a borehole. 4,415,805., Cl. 250-260.000.

Fiala, Jimmy L.: *See*—
Dressler, Daryl D.; and Fiala, Jimmy L., 4,415,894., Cl. 340-825.570.

Fiber Industries, Inc.: *See*—
Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,414,801., Cl. 57-288.000.

Fibinger, Vratislav: *See*—
Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, 4,414,905., Cl. 110-245.000.

Fieberg, Donald E.: *See*—
Fieberg, Russell F.; and Fieberg, Donald E., 4,414,736., Cl. 29-747.000.

Fieberg, Russell F.; and Fieberg, Donald E., to Russtech Engineering Company, Inc. Insertion and extraction tool for connector terminals. 4,414,736., Cl. 29-747.000.

Field, Thomas R., to Jenn-Air Corporation. Induction cartridge. 4,415,788., Cl. 219-10.49R.

Fields, Ellis K., to Standard Oil Company (Indiana). Class of Friedel-Crafts catalysts. 4,415,483., Cl. 502-255.000.

Finch, Harvey E.; and Strong, James J. Self-cleaning screen. 4,415,462., Cl. 210-767.000.

Finck, Frederick P., Jr.; and Ely, Timothy B., to Highfield Mfg. Company, Div. of Clarkson Industries, Inc. Lockable ring assembly for electric meter. 4,415,190., Cl. 292-256.600.

Firestone Tire & Rubber Company, The: *See*—
Sarkar, Sunil B., 4,415,695., Cl. 524-405.000.

Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Compagnie: *See*—
Neumann, Manfred, 4,414,702., Cl. 16-35.00R.

Fischer, Hermann, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Sheet-fed rotary prime and verso offset printing machine & method. 4,414,896., Cl. 101-211.000.

Fisher, Berish M. Monitoring device and method for accurately determining and recording present demand of electrical energy. 4,415,853., Cl. 324-74.000.

Fisons Limited: *See*—
Young, David M.; Mitchell, Donald F.; and Amey, Edward, 4,414,972., Cl. 128-200.230.

Fitch, John L.: *See*—
Medlin, William L.; Strubhar, Malcolm K.; and Fitch, John L., 4,415,035., Cl. 166-308.000.

Fitzgerald, William T.: *See*—
Stanescu, Mircea-Stefan; and Fitzgerald, William T., 4,415,379., Cl. 148-16.000.

Fives-Cail Babcock: *See*—
Longuet, Andre, 4,415,407., Cl. 159-13.00A.

Flagg, Jack J., to Dresser Industries, Inc. Well logging data transmission system. 4,415,895., Cl. 340-856.000.

Fletcher, Thomas D., to Signetics Corporation. Bipolar logic gate including circuitry to prevent turn-off and deep saturation of pull-down transistor. 4,415,817., Cl. 307-454.000.

Flores, Lawrence N.: *See*—
Sprague, Robert A.; and Flores, Lawrence N., 4,415,915., Cl. 346-160.000.

Floyd, James N., to Moss, James W. Thermal die-cutting machine for die-cutting letters, numerals and other characters from plastic tape. 4,415,284., Cl. 400-134.000.

FMC Corporation: *See*—
Nochumson, Samuel; and Witt, Henry J., 4,415,428., Cl. 204-299.00R.
Scharpf, William G.; and Glenn, Michael S., 4,415,748., Cl. 560-227.000.

Fogarty, A. Edward; and Fogarty, Bonnie R. Fashion and hairstyle doll play set. 4,414,774., Cl. 46-22.000.

Fogarty, Bonnie R.: *See*—
Fogarty, A. Edward; and Fogarty, Bonnie R., 4,414,774., Cl. 46-22.000.

Fogt, Eric J.: *See*—
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666., Cl. 435-179.000.

Foley, Peter N.: *See*—
Turbard, Alan M.; and Foley, Peter N., 4,414,818., Cl. 62-176.100.

Force Control Industries, Inc.: *See*—
Cory, Halsey W., 4,415,067., Cl. 188-71.500.

Ford, Charles R.; and Gatsos, Stephen L., to Indus Wheel Company. Wheel rim apparatus and method. 4,414,728., Cl. 29-159.100.

Ford Motor Company: *See*—
Holloway, Henry, 4,415,531., Cl. 420-564.000.
Horvath, Stanley K., 4,415,681., Cl. 523-334.000.
Janotik, Adam M.; and Kazyak, Lawrence P., 4,414,733., Cl. 29-568.000.
Novak, Robert F., 4,415,878., Cl. 338-34.000.
Peng, Stephen C.; and Nordstrom, John D., 4,415,697., Cl. 524-512.000.
Strasser, Robert A.; and Goch, Stephen W., 4,414,902., Cl. 102-531.000.
Svab, Eugen, 4,414,862., Cl. 74-788.000.

Fortmann, William E., to United Technologies Corporation. Temperature regulation of air cycle refrigeration systems. 4,415,307., Cl. 415-12.000.

Foss, George D., to Minnesota Mining and Manufacturing Company. Air pollution control process. 4,415,342., Cl. 55-96.000.

Foster, Glenn M. Waste-burning furnace. 4,414,904., Cl. 110-102.000.

Foucras, Jacques; and Rodet, Georges, to Rhone-Poulenc Industries. Separatory apparatus comprising means for anchoring a semi-permeable membrane to a support member. 4,415,447., Cl. 210-321.100.

Fox, Richard J. Radiation dosimeter. 4,415,237., Cl. 250-370.000.

Foxboro Company, The: *See*—
Bryzek, Janusz, 4,414,853., Cl. 73-766.000.

Frahme, Carl E. Heat insulating module for high temperature chambers. 4,414,786., Cl. 52-506.000.

Frame, Norman J.; Walber, James P.; and Janick, Jan M., to W. H. Brady Co. Membrane switch. 4,415,781., Cl. 200-5.00A.

Franck, Heinz-Gerhard: *See*—
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,415,429., Cl. 208-8.0LE.
Franke, Albrecht: *See*—
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571., Cl. 424-250.000.
Franke, George, to Simplex Time Recorder Co. Printer countwheel mechanism. 4,415,801., Cl. 235-101.000.
Fraser, Ward M. Device for providing a reinforced foam lining for well bore holes. 4,415,269., Cl. 366-132.000.
Freeze, Eugene A. Riding saddle. 4,414,791., Cl. 54-44.000.
Frei, Willi, to VAT Aktiengesellschaft fur Vakuum-Apparate-Technik. Pneumatic drive for switching elements and control elements. 4,414,882., Cl. 91-442.000.
Freitag, Dieter: *See*—
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719., Cl. 528-167.000.
French, John A. W., to WIPAC Group Sales Limited. Support devices for swivel chairs. 4,415,135., Cl. 248-161.000.
Freyer, Larry E.: *See*—
Shipley, Randall S.; and Freyer, Larry E., 4,415,712., Cl. 526-122.000.
Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, to United States of America, Health and Human Services. Cross-slice data acquisition system for pet scanner. 4,415,807., Cl. 250-363.00S.
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, to BBC Aktiengesellschaft, Brown, Boveri & Cie.; and Knorr-Bremse GmbH. Actuator for an air valve placed in the boost air duct of an IC engine. 4,414,952., Cl. 123-559.000.
Fritschi, Edgar: *See*—
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang. 4,415,495., Cl. 260-239.00D.
Fritts, Rex E.: *See*—
Diesch, Bradford J.; and Fritts, Rex E., 4,415,790., Cl. 219-10.55B.
Fritz Pollems Kommanditgesellschaft: *See*—
Eichkorn, Franz, 4,415,046., Cl. 175-56.000.
Frohberger, Paul-Ernst: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586., Cl. 424-273.00R.
Frosch, Albert; Hinkel, Holger; and Kraus, Georg, to International Business Machines Corporation. Magnetic disk substrate of fiber-reinforced plastic. 4,415,942., Cl. 360-135.000.
Frost, Rodney I.; and Montierth, Max R., to Corning Glass Works. Diesel particulate filters for use with smaller diesel engines. 4,415,344., Cl. 55-523.000.
Frye, Gregory G.: *See*—
Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767., Cl. 381-45.000.
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, to Evana Tool & Engineering Inc. Folding of flat sheet to exact interior height. 4,415,325., Cl. 425-397.000.
Fuchs, Uwe, to Linde Aktiengesellschaft. Nitrification treatment of wastewater. 4,415,454., Cl. 210-616.000.
Fuglein, Egon, to Sachs Systemtechnik GmbH. Workpiece palette. 4,415,619., Cl. 428-131.000.
Fuji Electric Co., Ltd.: *See*—
Tsubuku, Mitsuro; and Yoshihiro, Tadanobu, 4,415,305., Cl. 414-753.000.
Fuji Koeki Corporation: *See*—
Takematsu, Yoshiyuki, 4,415,247., Cl. 354-33.000.
Fuji Photo Film Co., Ltd.: *See*—
Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,415,650., Cl. 430-273.000.
Nakamura, Sukenori; Igarashi, Akira; and Matsukawa, Hiroharu, 4,415,633., Cl. 428-411.000.
Nishizawa, Jun-ichi; and Konishi, Masahiro, 4,415,937., Cl. 358-335.000.
Fuji Xerox Co., Ltd.: *See*—
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,415,904., Cl. 346-1.100.
Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, 4,415,933., Cl. 358-281.000.
Fujii, Tadaaki: *See*—
Masuda, Naosuke; Ohe, Takeshi; and Fujii, Tadaaki, 4,415,319., Cl. 418-135.000.
Fujimaki, Yoshihide: *See*—
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59.000.
Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,641., Cl. 430-59.000.
Fujishima, Tooru: *See*—
Oguino, Masanori; Fujishima, Tooru; and Matsumoto, Jun, 4,416,002., Cl. 369-44.000.
Fujitani, Yoshitomo: *See*—
Tanaka, Junzo; Kai, Toshio; and Fujitani, Yoshitomo, 4,415,799., Cl. 219-400.000.
Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,415,965., Cl. 364-136.000.
Fujitsu Limited: *See*—
Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370., Cl. 148-1.500.
Komenou, Kazunari; Miyashita, Tsutomu; and Ohashi, Makoto, 4,415,988., Cl. 365-16.000.
Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,414,850., Cl. 73-599.000.
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, to Toyo Jozo Kabushiki Kaisha. 19-Deformyl-deoxydesmycosin. 4,415,730., Cl. 536-7.100.
Fukuoka, Tatsuhiko: *See*—
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,415,168., Cl. 277-96.100.
Fukuyama, Hiroomi; and Isobe, Shinichi. Method of constant peripheral speed control. 4,415,977., Cl. 364-474.000.
Fulford, Dennis R., to A. F. Trenchers Limited. Tractor drive mechanism. 4,415,053., Cl. 180-74.000.
Funk, Erwin D., to Kamyr, Inc. Materials transfer system and methodology. 4,415,296., Cl. 406-19.000.
Furukawa, Akira; Araki, Minoru; and Genma, Hideyuki, to Suzuki Motor Company Limited. Automobile windows. 4,415,195., Cl. 296-146.000.
Furukawa, Hiroyasu: *See*—
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,415,708., Cl. 525-316.000.
Fushimi, Hitoshi: *See*—
Takahashi, Masahiro; Hamada, Takuji; and Fushimi, Hitoshi, 4,416,008., Cl. 370-88.000.
G. A. Serlachius Oy: *See*—
Larikka, Leo, 4,414,835., Cl. 72-71.000.
G. D Societa' per Azioni: *See*—
Seragnoli, Enzo, 4,415,127., Cl. 242-58.100.
Gachegov, Ivan G., deceased: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Gachegova, Lidia T., administrator: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Gaines, Jack R.: *See*—
Boyles, David A.; Gaines, Jack R.; and Haissig, Bruce E., 4,415,350., Cl. 71-77.000.
Gaiser, Robert F., to Bendix Corporation, The. Master cylinder. 4,414,811., Cl. 60-589.000.
Gaiser, Ronald D.: *See*—
Palmquist, Steven R.; and Gaiser, Ronald D., 4,415,861., Cl. 328-58.000.
Galloway, James H., to Energy Development Associates, Inc. Method and apparatus for supplying cooling liquid to a storage battery. 4,415,847., Cl. 320-2.000.
Gamba, Giancesare; and Bonomi, Luciano, to Dispersa AG. Pharmaceutical preparation for treating glaucoma and ocular hypertension. 4,415,564., Cl. 424-244.000.
Gans, Michael J., to Bell Telephone Laboratories, Incorporated. Low power beam switchable antenna arrangement. 4,415,901., Cl. 343-754.000.
Ganser, Volker: *See*—
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang. 4,415,495., Cl. 260-239.00D.
Ganter, Wolfgang, to Gebruder Junghans GmbH. Time adjusting mechanism for an electronic wristwatch with a manual adjusting stem. 4,415,277., Cl. 368-190.000.
Garg, Sunil K.: *See*—
Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., 4,415,521., Cl. 264-176.00F.
Garkavy, Anatoly L.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Garner, John N.; Roberge, Jean M.; and Baxter, Douglas G., to Northern Telecom Limited. Apparatus for stranding wire. 4,414,802., Cl. 57-293.000.
Garnett, Donald W., to Olofsson Corporation, The. Tool changing mechanism. 4,414,724., Cl. 29-39.000.
Garrett, David L., to Metco Properties. Metal phthalocyanine on a substrate. 4,415,526., Cl. 376-409.000.
Garves, John C. Cantilever attachment. 4,415,137., Cl. 248-629.000.
Garza, Cesario S., Jr.: *See*—
Lachmann, Leonard P.; and Garza, Cesario S., Jr., 4,415,983., Cl. 364-708.000.
Gas Research Institute: *See*—
Smith, Robert B., 4,415,390., Cl. 156-187.000.

Gaskey, Kenneth M.; Gupta, Indra; and Cline, Richard S., to Inland Steel Company. Continuous annealing apparatus and method. 4,415,382., Cl. 148-153.000.

Gates, Walter C., ...: *See*—
Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., 4,415,478., Cl. 502-181.000.

Gatsos, Stephen L.: *See*—
Ford, Charles R.; and Gatsos, Stephen L., 4,414,728., Cl. 29-159.100.

Gauer, Larry C., to Deere & Company. Engine compartment enclosure. 4,415,052., Cl. 180-69.00R.

Gauler, Allen L.; and Pasieka, Donald F. Ball mounting fixture for a roundness gage. 4,414,748., Cl. 33-174.00Q.

Gaulke, Ronald R.: *See*—
Vogl, Norbert M.; Gaulke, Ronald R.; and Harkness, Joseph R., 4,414,934., Cl. 123-192.00B.

Gaunaurd, Guillermo C.; and Uberall, Herbert, to United States of America, Navy. Method of determining the material composition of a dielectrically coated radar target/obstacle. 4,415,898., Cl. 343-5.0SA.

Gaussens, Gilbert: *See*—
Valiot, Catherine; Lemaire, Francis; and Gaussens, Gilbert, 4,415,603., Cl. 427-54.100.

Gearhart Industries, Inc.: *See*—
Pratt, Donna K.; and Terrell, Jamie B., 4,415,029., Cl. 166-212.000.

Gebruder Junghans GmbH: *See*—
Ganter, Wolfgang, 4,415,277., Cl. 368-190.000.

Gehring, Johann: *See*—
Birkle, Siegried; Gehring, Johann; and Stoger, Klaus, 4,415,422., Cl. 204-199.000.

Geisinger, Wolfgang. Handle applicator. 4,415,399., Cl. 156-475.000.

Gelernt, Barry; and Wang, C. Wallace, to Perkin-Elmer Corporation, The. End-point detection in plasma etching or phosphosilicate glass. 4,415,402., Cl. 156-626.000.

Gelman, Boris: *See*—
Daly, William T.; Gelman, Boris; and Sanderson, William R., 4,415,244., Cl. 353-101.000.

General Conveyors Limited: *See*—
Dotson, Robert S.; Richeson, W. George; and Trenka, Herb M., 4,414,974., Cl. 128-305.000.

General Dynamics, Pomona Division: *See*—
Hartouni, Edward, 4,414,906., Cl. 110-293.000.

General Electric Company: *See*—
Balchunas, Charles A., 4,415,796., Cl. 219-253.000.
Cusano, Dominic A.; and DiBianca, Frank A., 4,415,808., Cl. 250-367.000.
Davis, Vincent L.; and Smith, Raymond J. D., 4,415,605., Cl. 427-65.000.
Griffing, Bruce F.; Johnson, Peter D.; and Johnson, Roger N., 4,415,955., Cl. 362-225.000.
Hedges, Charles V.; and Mark, Victor, 4,415,723., Cl. 528-204.000.
Hedges, Charles V.; and Mark, Victor, 4,415,725., Cl. 528-204.000.
Mark, Victor, 4,415,696., Cl. 524-490.000.
Mark, Victor; and Hedges, Charles V., 4,415,722., Cl. 528-196.000.
Mark, Victor; and Hedges, Charles V., 4,415,724., Cl. 528-204.000.
McLean, James O., 4,414,884., Cl. 99-304.000.
Mishra, Amarendra; Speros, Dimitri M.; and Eastin, Roger M., 4,415,835., Cl. 313-627.000.
Morris, George E., 4,414,820., Cl. 62-226.000.
Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., 4,415,830., Cl. 313-331.000.
Stephenson, Edgar O.; and Brown, Victor R. R., 4,415,184., Cl. 285-47.000.
Welles, Kenneth B., 4,415,856., Cl. 324-208.000.

General Kinematics Corporation: *See*—
Guptail, William G., 4,415,444., Cl. 209-3.000.

General Molding, Inc.: *See*—
McNesky, Guy P.; and Rice, E. Dale, 4,415,075., Cl. 202-177.000.

General Motors Corporation: *See*—
Bauer, Steven W., 4,415,194., Cl. 296-76.000.
Burris, Darryl L., 4,414,809., Cl. 60-424.000.
Griffith, Donald B.; and Alexander, Timothy C., 4,415,812., Cl. 290-38.00R.
McMahan, David R., 4,415,956., Cl. 362-269.000.
Mellin, Robert C., 4,414,925., Cl. 123-41.120.
Walker, Frank H., 4,414,805., Cl. 60-39.161.

General Signal Corporation: *See*—
Greey, David N., 4,415,408., Cl. 162-198.000.

General Symmetrics, Inc.: *See*—
Engel, Douglas A., 4,415,158., Cl. 273-153.00S.

Genma, Hideyuki: *See*—
Furukawa, Akira; Araki, Minoru; and Genma, Hideyuki, 4,415,195., Cl. 296-146.000.

George, Benjamin T.: *See*—
Swenson, Robert E.; Sasscer, Lawrence D.; and George, Benjamin T., 4,415,970., Cl. 364-200.000.

George Fischer, Ltd.: *See*—
Zadera, Lumir, 4,415,015., Cl. 164-37.000.

George, Henry H., Jr.: *See*—
Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., 4,415,521., Cl. 264-176.00F.

Georgia Tech Research Institute: *See*—
May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., 4,415,591., Cl. 424-330.000.

Gerber, Bernard R.: *See*—
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,415,121., Cl. 239-229.000.

Gergis, Isoris S.; and Lee, Wai-Tak P., to Rockwell International Corporation. Complementary bi-level magnetic bubble propagation circuit. 4,415,990., Cl. 365-41.000.

Germak, Jan: *See*—
Beranek, Jaroslav; Germak, Jan; Dobrozemsky, Jaroslav; and Fibinger, Vratislav, 4,414,905., Cl. 110-245.000.

Germane, Keith L.: *See*—
Wong, Alan S.; Karwan, Mitchell S.; and Germane, Keith L., 4,414,981., Cl. 128-712.000.

Gerry, Frank S.: *See*—
Wiggins, Wayne T.; and Gerry, Frank S., 4,415,520., Cl. 264-171.000.

Gerzon, Koert, to BetaMED Pharmaceuticals, Inc. Herpes treatment. 4,415,590., Cl. 424-319.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Werner, Georg; and Wisniewski, Paul, 4,415,295., Cl. 405-291.000.

Gibeau, Frank C.; and Farmer, Paul L., to Atasi Corporation. Linear actuator for memory storage device. 4,415,941., Cl. 360-106.000.

Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., to Votan. Method and apparatus for speech recognition and reproduction. 4,415,767., Cl. 381-45.000.

Gillette Company, The: *See*—
Fang, Florence S., 4,415,551., Cl. 424-65.000.

Gillis, Robert E. Flexible vault structure having multiple piece poles. 4,414,993., Cl. 135-104.000.

Gilroy, Keith: *See*—
Evans, John M.; and Gilroy, Keith, 4,414,983., Cl. 128-747.000.

Ginter, Tom, Jr. Automobile exhaust pipe clamping device. 4,415,188., Cl. 285-420.000.

Giordano, Francis P.; and Henshaw, Robert J., to International Business Machines Corporation. Gray scale electrostatic recording system and a stylus driver therefor. 4,415,914., Cl. 346-154.000.

Gitlin, Richard D., to Bell Telephone Laboratories, Incorporated. Timing acquisition in voiceband data sets. 4,416,015., Cl. 375-14.000.

Gits, Norbert W. Assembled multi-component seal. 4,415,167., Cl. 277-88.000.

Gittelbauer, Joachim, to Klockner-Humboldt-Deutz AG. Cooling device for carbon anodes. 4,414,825., Cl. 62-374.000.

Glass, Michael; Koch, Edwin R.; and Corsello, Vincent, to Warner Lambert Company. Chewing gum base. 4,415,593., Cl. 426-4.000.

Glenn, Michael S.: *See*—
Scharpf, William G.; and Glenn, Michael S., 4,415,748., Cl. 560-227.000.

Glesmann, Herbert C.: *See*—
Fasse, Mark E.; and Glesmann, Herbert C., 4,414,903., Cl. 104-244.100.

Glock, Hans, to Siemens Aktiengesellschaft. Read amplifier for a bipolar memory module. 4,415,995., Cl. 365-190.000.

Goch, Stephen W.: *See*—
Strasser, Robert A.; and Goch, Stephen W., 4,414,902., Cl. 102-531.000.

Goda, Tadahiro: *See*—
Maeda, Koji; and Goda, Tadahiro, 4,415,968., Cl. 364-178.000.

Godecke Aktiengesellschaft: *See*—
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495., Cl. 260-239.00D.

Goedert, Jean: *See*—
Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358., Cl. 75-58.000.

Goeth, Hanns: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,415,566., Cl. 424-246.000.

Goldstein, Richard N., to President and Fellows of Harvard College. Method of making a cloning vector. 4,415,660., Cl. 435-172.000.

Goncalves, Antonio. Carrier album case. 4,415,081., Cl. 206-311.000.

Gontier, Maurice: *See*—
Reymond, Jean C.; and Gontier, Maurice, 4,415,922., Cl. 358-22.000.

Gonzales, Louis P.; and Long, Dennis M. Fruit squeezer. 4,414,886., Cl. 99-495.000.

Goodyear Tire & Rubber Company, The: *See*—
Bell, Anthony J., 4,415,715., Cl. 526-142.000.
Grimm, Donald C., 4,415,690., Cl. 524-112.000.
Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., 4,414,843., Cl. 73-66.000.
Weinstein, Arthur H., 4,415,704., Cl. 525-76.000.

Goozner, Calman. Solderless electrical splice. 4,415,215., Cl. 339-98.000.

Gordon, Charles C.: *See*—
Laug, Owen B.; Gordon, Charles C.; and Stone, Robert O., 4,415,974., Cl. 364-426.000.

Gordon, Marvin; and Lichtenstein, Joseph, to Whitman Medical Corporation. Liquid dispensing device with cartridge-rupturing member. 4,415,288., Cl. 401-132.000.

Gotaverken Motor U.S. Inc.: *See*—
Odmann, Gert O., 4,415,000., Cl. 137-318.000.

Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, to Canon Kabushiki Kaisha. Process for preparing photoconductive cadmium sulfide. 4,415,643., Cl. 430-94.000.

Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, to Konishiroku Photo

Industry Co., Ltd. Electrophotographic element with fluorenylidene hydrazone compounds. 4,415,640., Cl. 430-59.000.

Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, to Konishiroku Photo Industry Co., Ltd. Electrophotographic light-sensitive element. 4,415,641., Cl. 430-59.000.

Gotoh, Takayuki: *See*—
Karasaki, Toshihiko; Gotoh, Takayuki; Namba, Yasuhiro; and Yamakawa, Eiji, 4,415,246., Cl. 354-25.000.

Gottfried Bischoff Bau Koml. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. KG: *See*—
Hegemann, Karl-Rudolf; Weissert, Helmut; and Hinsken, Kurt, 4,415,142., Cl. 266-89.000.

Gottlob, Heinz; and Falk, Horst, to Carl-Zeiss-Stiftung. Optical test chart for testing binocular reading ability. 4,415,243., Cl. 351-201.000.

Goudon, Jean-Claude: *See*—
Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753., Cl. 33-356.000.

Goudreau, Noel; Colevris, Nick; and Southard, Carl, to Trico Products, Incorporated. Batting practice apparatus. 4,415,155., Cl. 273-26.00E.

Gould Inc.: *See*—
McNeill, Thomas J., 4,414,852., Cl. 73-765.000.

Goyarts, Wynand M., to Ingersoll-Rand Company. Cutter bit assembly. 4,415,208., Cl. 299-91.000.

Grabchev, Boris L.: *See*—
Podola, Nikolai V.; Kuchuk-Yatsenko, Sergei I.; Krivonos, Vadim P.; and Grabchev, Boris L., 4,415,793., Cl. 219-110.000.

Grabner, Roy; and Paul, Edward L., to Merck & Co., Inc. Motionless mixer as cell culture propagator. 4,415,670., Cl. 435-285.000.

Grafton Limited: *See*—
Bury, John E., 4,415,285., Cl. 400-196.100.

Grana, David C.; and Inge, Spencer V., Jr., to United States of America, National Aeronautics and Space Administration. Vertical shaft windmill. 4,415,311., Cl. 416-117.000.

Grant, Douglas M., to ISCO, Inc. Sample collector. 4,415,011., Cl. 141-284.000.

Grantham, Daniel H.; and Swindal, James L., to United Technologies Corporation. Electrostatic bonded, silicon capacitive pressure transducer. 4,415,948., Cl. 361-283.000.

Gratzer, Nelson R.; and Wright, William E., to Carrier Corporation. Method for expanding tubular blanks. 4,414,834., Cl. 72-58.000.

Gravel, Charles L.: *See*—
Bice, James W.; Gravel, Charles L.; and Bernstein, Harold, 4,414,837., Cl. 73-1.00B.

Graves, James A.: *See*—
Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., 4,415,830., Cl. 313-331.000.

Gray, Antonio, to C. I. S. E., SpA. Electromagnetic telephone coupling device. 4,415,769., Cl. 179-2.00C.

Graybeal, Harold N., to Armstrong World Industries, Inc. Rotary screen squeegee rod. 4,414,915., Cl. 118-213.000.

Great Lakes Carbon Corporation: *See*—
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,416,014., Cl. 373-93.000.

Green, David T., to United States Surgical Corporation. Surgical stapling assembly having resiliently mounted anvil. 4,415,112., Cl. 227-19.000.

Green, Floyd H., to Green, Floyd H. Spare bowling computer for spot bowlers. 4,415,327., Cl. 434-249.000.

Greene, James M., to Eli Lilly and Company. Process for preparing phenylalkanoic acids. 4,415,751., Cl. 562-478.000.

Greey, David N., to General Signal Corporation. Apparatus, and method for controlling consistency. 4,415,408., Cl. 162-198.000.

Gregg, David W.: *See*—
Aiman, William R.; and Gregg, David W., 4,415,339., Cl. 48-62.00R.

Gregor Jonsson Associates, Inc.: *See*—
Betts, E. Douglas, 4,414,709., Cl. 17-71.000.

Grenoble, Dane C.; and Murrell, Lawrence L., to Exxon Research and Engineering Co. Hydrocarbon cracking using transition metal oxide Bronsted acid catalysts. 4,415,437., Cl. 208-120.000.

Grenoble, Dane C.: *See*—
Murrell, Lawrence L.; and Grenoble, Dane C., 4,415,480., Cl. 502-242.000.

Gries, Josef: *See*—
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571., Cl. 424-250.000.

Griffing, Bruce F.; Johnson, Peter D.; and Johnson, Roger N., to General Electric Company. Irradiation apparatus utilizing linear radiation sources. 4,415,955., Cl. 362-225.000.

Griffith, Donald B.; and Alexander, Timothy C., to General Motors Corporation. Electric starting system. 4,415,812., Cl. 290-38.00R.

Grigorieva, Elizaveta A.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podsnenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.

Grimes, Robert G., to Baxter Travenol Laboratories, Inc. Method of making a frangible port protector. 4,415,393., Cl. 156-244.130.

Grimm, Donald C., to Goodyear Tire & Rubber Company, The. Succinic anhydride derivatives as a scorch inhibitor for carboxylated rubbers. 4,415,690., Cl. 524-112.000.

Grosmaitre, Andre M. J.: *See*—
Mansel, Jean E.; Masson, Charlie M. P.; Bertaux, Paul; and Grosmaitre, Andre M. J., 4,415,461., Cl. 210-757.000.

Gross, Kenny C.; and Strain, Robert V. Apparatus for and method of monitoring for breached fuel elements. 4,415,524., Cl. 376-216.000.

Gross, William H., to National Semiconductor Corporation. One and one half pole audio power amplifier frequency compensation. 4,415,868., Cl. 330-294.000.

Grot, Walther G., to Du Pont de Nemours, E. I., and Company. Process for esterifying fluorinated carboxylic acid polymer. 4,415,679., Cl. 521-31.000.

Grow Group, Inc.: *See*—
Paris, Rafael R., 4,415,099., Cl. 222-94.000.

Gruber, Robert J.; Bolte, Steven B.; and Agostine, Doretta, to Xerox Corporation. Nitrogen containing polymers as charge enhancing additive for electrophotographic toner. 4,415,646., Cl. 430-110.000.

Grudzinskas, Charles V.; and Nachtigall, Guenter W., to American Cyanamid Company. Alkenylzirconium reagents useful for prostaglandin analog synthesis. 4,415,501., Cl. 260-429.300.

Grudzinskas, Charles V.; and Weiss, Martin J., to American Cyanamid Company. 16-Aryloxy-17,18,19,20-tetranorprostanoic acids and derivatives. 4,415,746., Cl. 560-61.000.

Grunden, Michael T.; and Roberts, William J., to Allied Corporation. Fuel and ignition control. 4,415,328., Cl. 431-1.000.

Gryger, Dana A.; and Drogichen, Daniel P., to Burroughs Corporation. Synchronous clock regenerator for binary serial data signals. 4,415,984., Cl. 364-900.000.

GTE Products Corporation: *See*—
De Cuester, Robert J. M.; Hoeben, Louis J. M.; and Wood, Clair, 4,415,836., Cl. 315-50.000.
Hidler, Henry T.; Hope, Lawrence L.; and Davey, Ernest A., 4,415,427., Cl. 204-298.000.
Keenan, James P., 4,415,834., Cl. 313-578.000.
Oetken, James E.; and Buschmann, Jeffrey P., 4,415,833., Cl. 313-559.000.
Rothwell, Harold L., Jr.; English, George J.; and Keeffe, William M., 4,415,829., Cl. 313-621.000.

Guenther, Torbett B., to C. D. Sparling Company. Wall bar. 4,415,141., Cl. 256-69.000.

Guerra, John M., to Polaroid Corporation. Device for illuminating transparencies. 4,415,958., Cl. 362-301.000.

Guilbeau, Karl G.: *See*—
Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., 4,415,463., Cl. 252-8.55R.

Guillemet, Michel J.; and Isert, Michel, to CII Honeywell Bull. Apparatus for managing the data transfers between a memory unit and the different processing units of a digital data processing system. 4,415,971., Cl. 364-200.000.

Gulf & Western Manufacturing Company: *See*—
Smith, Joseph E., 4,415,291., Cl. 403-36.000.

Gumkowski, Bert A.; and Limberg, John F., to Bendix Corporation, The. Disc brake and antirattle spring therefor. 4,415,068., Cl. 188-72.300.

Gupta, Indra: *See*—
Gaskey, Kenneth M.; Gupta, Indra; and Cline, Richard S., 4,415,382., Cl. 148-153.000.

Gupta, Surendra K.: *See*—
de Castro, Aurora F.; and Gupta, Surendra K., 4,415,655., Cl. 435-17.000.

Guptail, William G., to General Kinematics Corporation. Air cooling system for a vibratory sand reclaiming apparatus. 4,415,444., Cl. 209-3.000.

Gustafsson, Rolf E. O., to Telefonaktiebolaget L M Ericsson. Circuit arrangement for controlling the quiescent current in a class AB amplifier stage. 4,415,865., Cl. 330-271.000.

Gutermuth, Joachim: *See*—
Lennartz, Rudiger; and Gutermuth, Joachim, 4,415,448., Cl. 210-333.100.

Guttinger, Heinz, to Escher Wyss Limited. Rolling device. 4,414,889., Cl. 100-162.00B.

H. A. Kroon B.V.: *See*—
Kroon, Hendrik A., 4,415,368., Cl. 134-10.000.

H. Berthold, AG: *See*—
Pfister, Joseph, 4,415,109., Cl. 226-181.000.

H. Ikeuchi & Co., Ltd.: *See*—
Ikeuchi, Hiroshi, 4,415,123., Cl. 239-425.000.

Haas, Paul A.; and Ryon, Allen D. Apparatus for contacting particulate material with processing liquid. 4,415,536., Cl. 422-159.000.

Haas, Tommy B., to Abbott Laboratories. Single bead dispenser. 4,415,098., Cl. 221-202.000.

Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, to Kali-Chemie Pharma GmbH. Bis-sparteine derivatives and method of using same in therapy. 4,415,577., Cl. 424-258.000.

Hadler, Howard D.; and Kreftmeyer, James R., to Chromalloy American Corporation. Toolbar with wings foldable substantially 180 degrees. 4,415,043., Cl. 172-776.000.

Haeg, Steven R., to MTS Systems Corporation. Rotary actuator assembly. 4,414,854., Cl. 73-847.000.

Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, to Ishihara Sangyo Kaisha Ltd. Process for producing 4-benzoylpyrazoles. 4,415,739., Cl. 548-367.000.

Hagman, James R.: *See*—
Janakiraman, Ramachandran; Buckley, Douglas I.; Yamashiro, Donald H.; and Hagman, James R., 4,415,546., Cl. 424-1.100.

Haisma, Jan: *See—*
Braat, Josephus J. M.; Haisma, Jan; and Prast, Gijsbert, 4,415,238., Cl. 350-432.000.

Haissig, Bruce E.: *See—*
Boyles, David A.; Gaines, Jack R.; and Haissig, Bruce E., 4,415,350., Cl. 71-77.000.

Hale, Charles J. pH Meter probe assembly. 4,415,858., Cl. 324-438.000.

Hale, Thomas K.; and Kavaloski, Peter P., to Lockheed Corporation. Folding wheelchair. 4,415,177., Cl. 280-650.000.

Hall, John S.; and Phelps, Barry C., to California Interface and Software Limited Partnership. Double engraved identification card. 4,415,612., Cl. 428-29.000.

Hall, Thomas N.: *See—*
Cassell, Ronald L.; and Hall, Thomas N., 4,415,355., Cl. 71-121.000.

Hallenbeck, Emerson J. Purge gas unit with cones. 4,415,114., Cl. 228-57.000.

Halls, Lawrence M., to Sperry Corporation. Flexible crop harvesting header. 4,414,793., Cl. 56-14.400.

Hamada, Takuji: *See—*
Takahashi, Masahiro; Hamada, Takuji; and Fushimi, Hitoshi, 4,416,008., Cl. 370-88.000.

Hamaguchi, Shigeki: *See—*
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657., Cl. 435-106.000.

Hamilton, Harry J.: *See—*
Richards, Peter K.; and Hamilton, Harry J., 4,414,920., Cl. 119-29.000.

Hammond, Leslie A.: *See—*
Czulak, Jozeph; and Hammond, Leslie A., 4,415,594., Cl. 426-36.000.

Hamshar, John A.: *See—*
Matyas, Richard S.; and Hamshar, John A., 4,415,431., Cl. 208-8.00R.

Hang, Kenneth W.: *See—*
Prabhu, Ashok N.; and Hang, Kenneth W., 4,415,624., Cl. 428-209.000.

Hansen, Steven S.: *See—*
Bramfitt, Bruce L.; Hansen, Steven S.; Harper, Donald L.; and Pradhan, Roger R., 4,415,376., Cl. 148-12.00F.

Hanyu, Susumu: *See—*
Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, 4,414,908., Cl. 112-169.000.

Hargis, Duane C.; and Dubeck, Michael, to Ethyl Corporation. Catalytic process for the selective formation of ethanol and methyl acetate from methanol and synthesis gas. 4,415,749., Cl. 560-232.000.

Hargreaves, Jay T.; and Hensley, Albert L., to Standard Oil Company (Ind.). Multiple stage desalting and dedusting process. 4,415,434., Cl. 208-11.00R.

Hargrove, Homer G.: *See—*
Bayless, John R.; Hargrove, Homer G.; and Thompson, Edwin G., 4,415,021., Cl. 165-76.000.

Harju, Kai J.: *See—*
Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapolku, Pertti J., 4,415,659., Cl. 435-161.000.

Harkness, Joseph R.: *See—*
Vogl, Norbert M.; Gaulke, Ronald R.; and Harkness, Joseph R., 4,414,934., Cl. 123-192.00B.

Harmon, William R., Jr., to Bell Telephone Laboratories, Incorporated. Telephone ringing signal generator. 4,415,961., Cl. 363-43.000.

Harper, Donald L.: *See—*
Bramfitt, Bruce L.; Hansen, Steven S.; Harper, Donald L.; and Pradhan, Roger R., 4,415,376., Cl. 148-12.00F.

Harren, Hugh H. Air jet unit. 4,414,924., Cl. 123-25.00E.

Harris, Dale C.: *See—*
Clarke, John W.; and Harris, Dale C., 4,415,085., Cl. 206-526.000.

Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvratt, Matthew J., Jr., to Merck & Co., Inc. Bicyclic lactams. 4,415,496., Cl. 260-239.30B.

Hart, James F. Hydrojet. 4,414,695., Cl. 4-542.000.

Hart, Joseph J., to Container Corporation of America. Display carton. 4,415,078., Cl. 206-45.140.

Hartford, Thomas W.: *See—*
McDaniel, George H.; and Hartford, Thomas W., 4,415,985., Cl. 364-900.000.

Hartley, James T., to International Telephone and Telegraph Corporation. Tool for fiber optic cable clamp. 4,414,697., Cl. 7-107.000.

Hartouni, Edward, to General Dynamics, Pomona Division. Fuel cartridge and burner. 4,414,906., Cl. 110-293.000.

Harvey, Donald M., to Eastman Kodak Company. Movable infrared filter for an auto ranging camera. 4,415,245., Cl. 354-25.000.

Hasegawa, Junzo: *See—*
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657., Cl. 435-106.000.

Hasegawa, Shumpei: *See—*
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,414,950., Cl. 123-479.000.

Hasenauer, Charles R.; and Miller, Donald N., to Eastman Kodak Company. Antistatic composition and elements and processes utilizing same. 4,415,626., Cl. 428-323.000.

Hashimoto, Masayuki, to Clarion Co., Ltd. Method for manufacturing a semiconductive device. 4,415,384., Cl. 148-187.000.

Hashimoto, Yoshihiko: *See—*
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,415,708., Cl. 525-316.000.

Haskel, Incorporated: *See—*
Kelly, John W., 4,414,739., Cl. 29-727.000.

Hata, Shun-ichi: *See—*
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.

Hatfield, Walter B., Jr.: *See—*
Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906., Cl. 346-74.500.

Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, to Honda Giken Kogyo Kabushiki Kaisha. Suspension for motor vehicles. 4,415,178., Cl. 280-664.000.

Hattori, Shinichiro; and Inoue, Yasuo, to Olympus Optical Co., Ltd. Light source unit for an optical apparatus. 4,415,952., Cl. 362-32.000.

Hattori, Tadashi: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,414,840., Cl. 73-35.000.

Hauser, Ivo J.; and Lutz, Bruno, to Nestle Company, Inc., The. Blister package. 4,415,084., Cl. 206-461.000.

Hauze, Albert W.: *See—*
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609., Cl. 427-249.000.

Hay, Thomas M., III, to Sony Corporation. Programmable scan control circuit for providing bar graph display panel with selected scales and marker bars. 4,415,891., Cl. 340-753.000.

Hayashi, Yoshimasa, to Nissan Motor Company. Muffler. 4,415,059., Cl. 181-250.000.

Hedges, Charles V.; and Mark, Victor, to General Electric Company. Randomly branched aromatic polycarbonate from triphenol. 4,415,723., Cl. 528-204.000.

Hedges, Charles V.; and Mark, Victor, to General Electric Co. Aromatic branched polycarbonate from tetraphenol. 4,415,725., Cl. 528-204.000.

Hedges, Charles V.: *See—*
Mark, Victor; and Hedges, Charles V., 4,415,722., Cl. 528-196.000.
Mark, Victor; and Hedges, Charles V., 4,415,724., Cl. 528-204.000.

Hegemann, Karl-Rudolf; Weissert, Helmut; and Hinsken, Kurt, to Gottfried Bischoff Bau Koml. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. KG. Apparatus for handling converter gas. 4,415,142., Cl. 266-89.000.

Heil, Richard W.; and Rose, Thomas A. Method and apparatus for treating organic wastewater. 4,415,452., Cl. 210-614.000.

Heimbach, Heinrich: *See—*
Knoblauch, Karl; and Heimbach, Heinrich, 4,415,340., Cl. 55-25.000.

Hein, Wolfgang, to Carl Schleicher & Schuell GmbH & Co. KG. Vacuum filtration bench. 4,415,449., Cl. 210-406.000.

Heinis, Robert P.; and Vass, Eric, to Red Devil Inc. Paint mixer container clamping device with inertially driven can rotating function. 4,415,270., Cl. 366-216.000.

Heino, Dean L., to Deere & Company. Automatic electronic control for a power shift transmission. 4,414,863., Cl. 74-866.000.

Heinzelmann, Hans, to Kieninger & Obergfell Fabrik FuTechnische Laufwerke und Apparate. Electrical timepiece with hour-hand adjustment. 4,415,272., Cl. 368-69.000.

Heitmann, Jurgen, to Robert Bosch GmbH. Method and system for error correction in digital video signal recording. 4,415,938., Cl. 360-53.000.

Heller, Rudolf: *See—*
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952., Cl. 123-559.000.

Helm, Verne D.: *See—*
Epperson, Bonnie J.; Burnett, Lowell J.; and Helm, Verne D., 4,415,608., Cl. 427-244.000.

Henckel, David J.; and Peters, Thomas E., to Morrison-Knudsen Forest Products, Inc. Apparatus for producing a mat of directionally oriented lignocellulosic particles having cross-machine orientation. 4,415,324., Cl. 425-83.100.

Henkel Kommanditgesellschaft Auf Aktien: *See—*
Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124., Cl. 241-28.000.

Henry, Dale V.: *See—*
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,415,832., Cl. 313-533.000.

Henry, James W., to Eastman Kodak Company. Inspection of elongated material. 4,415,926., Cl. 358-107.000.

Henshaw, Robert J.: *See—*
Giordano, Francis P.; and Henshaw, Robert J., 4,415,914., Cl. 346-154.000.

Hensley, Albert L.: *See—*
Hargreaves, Jay T.; and Hensley, Albert L., 4,415,434., Cl. 208-11.00R.

Henze, Thomas W.: *See—*
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609., Cl. 427-249.000.

Herbert Kannegiesser GmbH & Co.: *See—*
Kreinberg, Manfred; and Petzold, Lothar, 4,414,765., Cl. 38-54.000.

Herchen, Stephen R.; and Messersmith, David, to Polaroid Corporation. Thiazolidine-substituted phenyl sulfonamides. 4,415,737., Cl. 548-146.000.

Hercules Incorporated: *See—*
Chandler, Carl D., Jr., 4,415,456., Cl. 210-673.000.

Pohl, Rudolph L., 4,415,654., Cl. 430-328.000.
Herdieckerhoff, Rainer, to Dr. Werner Herdieckerhoff, Firma. Metal charge treatment apparatus. 4,415,145., Cl. 266-253.000.
Herman, Heath H.: *See—*
May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., 4,415,591., Cl. 424-330.000.
Hermann Berstorff Maschinenbau GmbH: *See—*
Brinkmann, Heinz; and Chszaniecki, Siegfried, 4,415,268., Cl. 366-85.000.
Hermann Wangner GmbH & Co. KG: *See—*
Borel, Georg, 4,415,625., Cl. 428-222.000.
Hernandez, Sebastian, to Merck & Co., Inc. Substance and process for its production. 4,415,669., Cl. 435-253.000.
Hernandez, Walter C., to Ensco, Inc. Method and apparatus for detecting the presence of an animate body in an inanimate mobile structure. 4,415,979., Cl. 364-508.000.
Herner Glas Bernd Hoffbauer: *See—*
von Loewis of Menar, Axel, 4,415,614., Cl. 428-38.000.
Herrmann, Manfred: *See—*
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495., Cl. 260-239.00D.
Herzog, Rudolf, to Sulzer Brothers Limited. Control circuit for a controller and a method of operating the same. 4,415,966., Cl. 364-162.000.
Hess, W. John. Flowdown rearing pond. 4,414,919., Cl. 119-3.000.
Hester, Jackson B., Jr., to Upjohn Company, The. Process for inducing hypnosis. 4,415,583., Cl. 424-269.000.
Heyman, Arnold M. Wrist restraint. 4,414,969., Cl. 128-133.000.
Heymanns, Willi, to Jagenberg Werke AG. Rider rolls in support-roll winding machines. 4,415,128., Cl. 242-66.000.
Hibbits, David G.: *See—*
Chu, Wesley W.; and Hibbits, David G., 4,415,991., Cl. 365-77.000.
Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, to Victor Company of Japan, Ltd. Double error correcting system in digital signal reproducing apparatus. 4,416,010., Cl. 371-37.000.
Hidler, Henry T.; Hope, Lawrence L.; and Davey, Ernest A., to GTE Products Corporation. Thin film deposition by sputtering. 4,415,427., Cl. 204-298.000.
Highfield Mfg. Company, Div. of Clarkson Industries, Inc.: *See—*
Finck, Frederick P., Jr.; and Ely, Timothy B., 4,415,190., Cl. 292-256.600.
Higuchi, Masahiro: *See—*
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,415,627., Cl. 428-332.000.
Hill, Forrest G., to Marsh Stencil Machine Company. Ink roller assembly attachment. 4,414,899., Cl. 101-331.000.
Hill, Francis K. Apparatus for mixing and application of paving compositions. 4,415,267., Cl. 366-14.000.
Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, to International Business Machines Corporation. Magnetic disk substrate with a core of synthetic material. 4,415,634., Cl. 428-579.000.
Hinkel, Holger: *See—*
Frosch, Albert; Hinkel, Holger; and Kraus, Georg, 4,415,942., Cl. 360-135.000.
Hinnenkamp, James A., to National Distillers and Chemical Corporation. Water gas shift reaction employing intercalated metal carbonyl complex catalyst composition. 4,415,473., Cl. 252-373.000.
Hinsken, Kurt: *See—*
Hegemann, Karl-Rudolf; Weissert, Helmut; and Hinsken, Kurt, 4,415,142., Cl. 266-89.000.
Hintermann, Hans E.: *See—*
Niederhaeuser, Paul; Maillat, Michel; and Hintermann, Hans E., 4,415,419., Cl. 204-192.00C.
Hirabe, Kenji: *See—*
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381., Cl. 148-153.000.
Hiraiwa, Kazuyoshi: *See—*
Takada, Toshiaki; and Hiraiwa, Kazuyoshi, 4,415,786., Cl. 200-61.910.
Hirano, Takao: *See—*
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730., Cl. 536-7.100.
Hirohata, Michio; and Ogawa, Yukio, to Canon Kabushiki Kaisha. Electromagnetically operated shutter. 4,415,252., Cl. 354-234.000.
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., to Telectronics Pty. Ltd. Monitorable bone growth stimulator. 4,414,979., Cl. 128-419.00F.
Hirt, Max, to Ing. Alfred Schmidt GmbH. Mechanical sweeper for attachment to a carrier vehicle. 4,414,699., Cl. 15-87.000.
Hitachi, Ltd.: *See—*
Koike, Keiichi; and Yanadori, Michio, 4,415,465., Cl. 252-70.000.
Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262., Cl. 355-125.000.
Noda, Masaru, 4,415,923., Cl. 358-41.000.
Oguino, Masanori; Fujishima, Tooru; and Matsumoto, Jun, 4,416,002., Cl. 369-44.000.
Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, 4,415,385., Cl. 148-189.000.
Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, 4,415,457., Cl. 210-682.000.
Suemori, Noboru, 4,415,907., Cl. 346-76.0PH.
Takahashi, Masahiro; Hamada, Takuji; and Fushimi, Hitoshi, 4,416,008., Cl. 370-88.000.
Hitachi Plant Engineering and Construction Co., Ltd.: *See—*
Koike, Keiichi; and Yanadori, Michio, 4,415,465., Cl. 252-70.000.
Hochrain, Gerd L.: *See—*
Barba, Joseph; and Hochrain, Gerd L., 4,415,289., Cl. 402-17.000.
Hodges, Everett L. Drill section and method of hydraulically mining mineral formations. 4,415,206., Cl. 299-17.000.
Hoeben, Louis J. M.: *See—*
De Cuester, Robert J. M.; Hoeben, Louis J. M.; and Wood, Clair, 4,415,836., Cl. 315-50.000.
Hoechst Aktiengesellschaft: *See—*
Becker, Wilhelm, 4,415,682., Cl. 523-403.000.
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,487., Cl. 252-546.000.
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,488., Cl. 252-547.000.
Dryczynski, Kurt; Schadlich, Gunther; and Moraw, Roland, 4,415,947., Cl. 361-235.000.
Krause, Werner, 4,415,505., Cl. 260-543.00P.
Schlafer, Ludwig; and Uhrig, Heinz, 4,415,333., Cl. 8-524.000.
Volk, Heinrich; and Papenfahs, Theodor, 4,415,750., Cl. 562-467.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Davis, Larry; and Klein, Joseph T., 4,415,581., Cl. 424-267.000.
Hoekstra, Edith, legal representative: *See—*
Hoekstra, Gerald B., deceased, 4,415,433., Cl. 208-11.00R.
Hoekstra, Gerald B., deceased (by Hoekstra, Edith, legal representative), to Standard Oil Company (Indiana). Fluid bed retorting process with multiple feed lines. 4,415,433., Cl. 208-11.00R.
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., to Braun Aktiengesellschaft. Microprocessor driven digital display alarm clock. 4,415,273., Cl. 368-74.000.
Hoffman, Lionel B., to Tetras S.A. Electrophotographic copier apparatus. 4,415,263., Cl. 355-3.0SH.
Hoffmann-La Roche Inc.: *See—*
Uskokovic, Milan R.; and Wovkulich, Peter M., 4,415,742., Cl. 549-475.000.
Hofmann, Karl, to Robert Bosch GmbH. Fuel injection nozzle, particularly for diesel engines. 4,414,845., Cl. 73-119.00A.
Hogan, Roderick D. Earthquake fire safety system. 4,414,994., Cl. 137-38.000.
Hogg, Grady R., Jr.; and Tanner, Nathan S., to Great Lakes Carbon Corporation. Composite electrode for arc furnace. 4,416,014., Cl. 373-93.000.
Hohle, Deena G.: *See—*
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.
Hollerweger, Heinz: *See—*
Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, 4,415,148., Cl. 267-122.000.
Holloway, Henry, to Ford Motor Company. Semiconductor materials. 4,415,531., Cl. 420-564.000.
Holt, Anne: *See—*
Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., 4,415,521., Cl. 264-176.00F.
Holt, Richard C., to Augat Inc. Process for interconnecting components on a PCB. 4,414,741., Cl. 29-837.000.
Holthoff, Helmut, to Kocks Technik GmbH & Company. Bevel gear differential drives and methods for adjusting their tooth engagement. 4,414,859., Cl. 74-417.000.
Holzbaur, Siegfried, to Robert Bosch GmbH. Apparatus for forming the operating mixture, in particular for mixture compressing internal combustion engines having externally supplied ignition. 4,414,948., Cl. 123-452.000.
Homma, Hideo: *See—*
Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, 4,415,385., Cl. 148-189.000.
Honda, Eiichi: *See—*
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730., Cl. 536-7.100.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, 4,415,178., Cl. 280-664.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,414,950., Cl. 123-479.000.
Yamaguchi, Ken, 4,415,057., Cl. 180-227.000.
Honeywell Inc.: *See—*
Diddens, Paul A., 4,415,913., Cl. 346-154.000.
Lai, Juey H.; Douglas, Richard; and Shepherd, Lloyd, 4,415,653., Cl. 430-296.000.
Szonntagh, Eugene L., 4,415,278., Cl. 374-37.000.
Hongo, Chikara: *See—*
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,415,504., Cl. 260-501.120.
Honig, Gunther; Kiencke, Uwe; and Schulz, Alfred, to Robert Bosch GmbH. Apparatus for the control of repetitive events dependent on operating parameters of internal combustion engines. 4,414,949., Cl. 123-479.000.
Hopcroft, Peter W.: *See—*
McHarrie, John C.; Hopcroft, Peter W.; and Case, Donald B., 4,415,111., Cl. 227-19.000.
Hope, Lawrence L.: *See—*
Hidler, Henry T.; Hope, Lawrence L.; and Davey, Ernest A., 4,415,427., Cl. 204-298.000.

Horaguchi, Masao: *See*—
Takinami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, 4,414,828., Cl. 70-84.000.
Horgan, Anthony M., to Xerox Corporation. Multilayered photoresponsive device for electrophotography. 4,415,639., Cl. 430-57.000.
Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, to Alps Electric Co., Ltd. Serial printer. 4,414,893., Cl. 101-93.150.
Horiguchi, Shinju: *See*—
Ogawa, Katsuhiko; and Horiguchi, Shinju, 4,415,818., Cl. 307-465.000.
Horino, Shigeo: *See*—
Ohmura, Hideo; and Horino, Shigeo, 4,414,730., Cl. 29-426.300.
Horning, Randall A.: *See*—
Kirkup, Joseph F.; and Horning, Randall A., 4,415,875., Cl. 337-62.000.
Horrobin, David F., to Efamol Limited. Treatment for menstrual disorders. 4,415,554., Cl. 424-145.000.
Horvath, Joseph L., to International Business Machines Corporation. Thermal conduction element for semiconductor devices. 4,415,025., Cl. 165-185.000.
Horvath, Stanley K., to Ford Motor Company. Stabilized crosslinked dispersion. 4,415,681., Cl. 523-334.000.
Horwitz, E. Philip: *See*—
Vandegrift, George F.; Krumpelt, Michael; and Horwitz, E. Philip, 4,415,412., Cl. 204-67.000.
Hosoe, Kazuya: *See*—
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924., Cl. 358-50.000.
Houde-Walter, William R.: *See*—
Benton, Stephen A.; Houde-Walter, William R.; and Mingace, Herbert S., Jr., 4,415,225., Cl. 350-3.840.
Houkes, Henk, to U.S. Philips Corporation. Frequency converter for supplying an electrodeless discharge lamp. 4,415,838., Cl. 315-248.000.
Hours, Michel: *See*—
Turre, Gilles H. J.; Hours, Michel; and Labrude, Jacques R., 4,415,418., Cl. 204-180.00G.
House, James G.: *See*—
Cynkar, Thomas E.; and House, James G., 4,415,606., Cl. 427-90.000.
Houser, David E.; Kohn, Harold; and Williams, Gordon L., to International Business Machines Corporation. Impact pinner apparatus. 4,415,113., Cl. 227-130.000.
Howell, Venice T. Construction framing anchor. 4,414,785., Cl. 52-169.100.
Hoya Corporation: *See*—
Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,415,464., Cl. 252-62.510.
Hoyle, Charles E.; and Lenox, Ronald S., to Armstrong World Industries, Inc. Thermal development of color in a polyamide textile material with aminobenzenesulfonyl azides. 4,415,334., Cl. 8-694.000.
Hoyle, Charles E.: *See*—
Lenox, Ronald S.; and Hoyle, Charles E., 4,415,332., Cl. 8-444.000.
Hoyt, Richard E.: *See*—
Nielsen, Anker J., Jr.; and Hoyt, Richard E., 4,414,829., Cl. 70-160.000.
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, to Matsushita Electric Industrial Co., Ltd. Solar collector. 4,414,958., Cl. 126-450.000.
Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, to Exxon Research and Engineering Co. Electrodes for electrical coalescense of liquid emulsions. 4,415,426., Cl. 204-290.00R.
Hubbard, Merle H. Security cord holder. 4,414,711., Cl. 24-129.00C.
Huber, Hans-Peter; Burger, Erich; and Bickl, Horst, to AGFA-Gevaert AG. Optical copying arrangement. 4,415,255., Cl. 355-3.00R.
Hubner, Heimo: *See*—
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952., Cl. 123-559.000.
Hucal, Taras: *See*—
Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,415,426., Cl. 204-290.00R.
Hudson, Sharon J., Jr., to Sharon Manufacturing Company. Composite metal nipple. 4,415,187., Cl. 285-173.000.
Huff, Craig W. Check valve cylinder deactivation. 4,414,936., Cl. 123-198.00F.
Huffman, Charles E.; and Southerland, Stephen R., to Rockwell International Corporation. Synchronous coupling of framed data in digital transmission. 4,416,009., Cl. 370-100.000.
Hufnagel, Charles A. Occlusive clip and applicator for constricting flexible tubular members. 4,414,721., Cl. 128-325.000.
Hughes Aircraft Company: *See*—
Myer, Jon H., 4,414,985., Cl. 128-782.000.
Hughes Tool Company: *See*—
Atkinson, Gerald O., 4,414,734., Cl. 29-464.000.
Carlberg, Charles E., 4,415,193., Cl. 294-102.00A.
Huizinga, Donald D.; and Thompson, Paul W., to Bell Telephone Laboratories, Incorporated. Digital conferencing method and arrangement. 4,416,007., Cl. 370-62.000.
Hull, Maury L.; and Dorius, Lee, to University of California, The Regents of the. Electronically released snow ski binding. 4,415,176., Cl. 280-612.000.
Hume, Douglas W. Kinetic engine control. 4,414,930., Cl. 123-78.00E.
Humphrey Instruments, Inc.: *See*—
Humphrey, William E., 4,415,239., Cl. 350-433.000.
Humphrey, William E., to Humphrey Instruments, Inc. Reflection rejection spherical optical train composed of tipped lens elements. 4,415,239., Cl. 350-433.000.
Humphrey, William J.: *See*—
Witt, Enrique R.; Humphrey, William J.; and Cave, James P., 4,415,453., Cl. 210-615.000.
Hung, Peter C., to Porta Systems Comp. Multipole data switch. 4,415,783., Cl. 200-11.00A.
Hunt, Eric, to Beecham Group Limited. 3-Oxo-6-oxa-2-azatricyclo 5.4.2. unadecene-4-carboxylate. 4,415,584., Cl. 424-272.000.
Hunt, James P., to Huntington Alloys, Inc. Nickel-base welding alloy. 4,415,530., Cl. 420-453.000.
Hunt, William C., III, to Mobil Oil Corporation. Use of recycled combustion gas during termination of an in-situ combustion oil recovery method. 4,415,031., Cl. 166-261.000.
Hunter, C. LaMont. LP Gas-operated impact tool. 4,415,110., Cl. 227-10.000.
Hunter, Wood E.: *See*—
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417., Cl. 204-159.240.
Huntington Alloys, Inc.: *See*—
Hunt, James P., 4,415,530., Cl. 420-453.000.
Hunzicker, Dean L., to Hunzicker-Riley, Inc. Heat exchange ventilating unit. 4,415,019., Cl. 165-47.000.
Hunzicker-Riley, Inc.: *See*—
Hunzicker, Dean L., 4,415,019., Cl. 165-47.000.
Hurlbut, Donovan W.: *See*—
Ackerman, Richard C.; Jewer, Alan A.; and Hurlbut, Donovan W., 4,416,001., Cl. 369-44.000.
Hutchinson, Robert S. Drip catch reservoir. 4,415,100., Cl. 222-108.000.
Hutchison, James. Stilt device. 4,415,063., Cl. 182-230.000.
Hutter, G. Frederick, to Inmont Corporation. Rosin derivatives used as dispersants. 4,415,705., Cl. 525-167.500.
Hutter, Ralf: *See*—
Cook, Alasdair M.; and Hutter, Ralf, 4,415,658., Cl. 435-122.000.
Hyde, Donald B., Jr., to Hyde's Incorporated. Bird feeder. 4,414,922., Cl. 119-51.00R.
Hyder, Syed S., to Alephtran Technology N.V. Recognizer/converter for arabic and other language codes. 4,415,766., Cl. 178-30.000.
Hyde's Incorporated: *See*—
Hyde, Donald B., Jr., 4,414,922., Cl. 119-51.00R.
Iapicco, Jeffrey A., to Bell Telephone Laboratories, Incorporated. Differential phase shift keyed receiver. 4,416,016., Cl. 375-85.000.
Ibiden Co., Ltd.: *See*—
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,415,535., Cl. 422-143.000.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Refrigerated display case with colliding band air defrost. 4,414,822., Cl. 62-256.000.
Ida, Kozo: *See*—
Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, 4,415,509., Cl. 264-1.300.
Ideal Toy Corporation: *See*—
Lahr, Robert G., 4,415,157., Cl. 273-86.00B.
Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, to Bayer Aktiengesellschaft. Stabilized thermoplastic moulding compositions. 4,415,692., Cl. 524-183.000.
Idemitsu Kosan Company Limited: *See*—
Ono, Katsuhiro; and Sakimura, Shigeki, 4,415,702., Cl. 524-705.000.
Idler, Horst: *See*—
Vogel, Horst; Idler, Horst; and Taruttis, Arno H., 4,415,899., Cl. 343-413.000.
IDRAM Engineering Company EST.: *See*—
Baudin, Lucien, 4,415,322., Cl. 418-260.000.
Iezza, Franco S., to Scherling, J. Daniel. Portable knock-down parallel bar exercise fixture. 4,415,150., Cl. 272-63.000.
Igarashi, Akira: *See*—
Nakamura. Sukenori; Igarashi, Akira; and Matsukawa, Hiroharu, 4,415,633., Cl. 428-411.000.
Ikeda, Tomoaki: *See*—
Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,415,650., Cl. 430-273.000.
Ikeda, Yugo: *See*—
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
Ikehata, Yukio; and Ono, Kenichi, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,415,276., Cl. 368-187.000.
Ikeuchi, Hiroshi, to H. Ikeuchi & Co., Ltd. Atomizer nozzle assembly. 4,415,123., Cl. 239-425.000.
Ikuta, Hironori: *See*—
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567., Cl. 424-246.000.
Ima-Industria Macchine Automatiche-S.p.A.: *See*—
Romagnoli, Andrea, 4,415,597., Cl. 426-394.000.
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, to Fujitsu Fanuc Limited. Programmable sequence controller. 4,415,965., Cl. 364-136.000.
Immuno Aktiengesellschaft fur chemischmedizinische Produkte: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976., Cl. 128-334.00R.
Imperial Chemical Industries PLC: *See*—
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,415,523., Cl. 264-342.00R.

Nield, Eric; and Thompson, Martin K., 4,415,699., Cl. 524-538.000.
Pyke, David R.; and Reid, Robert, 4,415,757., Cl. 568-475.000.
Rose, John B., 4,415,720., Cl. 528-171.000.

Inazumi, Koichi: *See—*
Matsumoto, Akio; Inazumi, Koichi; and Araki, Kazuhiro, 4,415,274., Cl. 368-160.000.

Inco Limited: *See—*
Victorovich, Grigori S.; and Bell, Malcolm C., 4,415,356., Cl. 75-21.000.

Indus Wheel Company: *See—*
Ford, Charles R.; and Gatsos, Stephen L., 4,414,728., Cl. 29-159.100.

Industrial Cleaning and Coating, Inc.: *See—*
Bentley, Joseph J.; Brown, Thomas E.; and Unrine, Jerome, 4,414,917., Cl. 118-695.000.

Industrie Pirelli S.p.A.: *See—*
Angioletti, Attilio, 4,415,616., Cl. 428-48.000.

Ing. Alfred Schmidt GmbH: *See—*
Hirt, Max, 4,414,699., Cl. 15-87.000.

Inge, Spencer V., Jr.: *See—*
Grana, David C.; and Inge, Spencer V., Jr., 4,415,311., Cl. 416-117.000.

Ingersoll-Rand Company: *See—*
Goyarts, Wynand M., 4,415,208., Cl. 299-91.000.

Inland Steel Company: *See—*
Gaskey, Kenneth M.; Gupta, Indra; and Cline, Richard S., 4,415,382., Cl. 148-153.000.

Inmont Corporation: *See—*
Hutter, G. Frederick, 4,415,705., Cl. 525-167.500.

Inoue, Akihisa: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, 4,415,529., Cl. 420-434.000.

Inoue, Hirokazu: *See—*
Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, 4,415,385., Cl. 148-189.000.

Inoue, Nori; and Katsuki, Shogo, to Tokai Electrie Wire Company Limited. Female type electrical connector. 4,415,221., Cl. 339-258.00F.

Inoue, Takahiro; Takada, Yusaku; and Aoki, Takao, to Canon Kabushiki Kaisha. Apparatus for transferring images. 4,415,256., Cl. 355-3.0TR.

Inoue, Takayuki: *See—*
Iwasa, Tatsuya; Inoue, Takayuki; and Mizuta, Noriyuki, 4,415,765., Cl. 174-72.00A.

Inoue, Yasuo: *See—*
Hattori, Shinichiro; and Inoue, Yasuo, 4,415,952., Cl. 362-32.000.

Insolar, Inc.: *See—*
Wasserman, Kurt J., 4,414,960., Cl. 126-426.000.

Institut fur Immunologie Inselspital: *See—*
de Weck, Alain L.; Schneider, Conrad H.; and Rolli, Hans P., 4,415,492., Cl. 260-112.50R.

Instrument Components Co., Inc.: *See—*
Wereb, John A., 4,415,049., Cl. 180-6.500.

Intel Corporation: *See—*
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969., Cl. 364-200.000.

International Business Machines Corporation: *See—*
Collins, Thomas W.; and Tao, Lung-jo, 4,415,987., Cl. 365-12.000.
Dickson, LeRoy D., 4,415,224., Cl. 350-3.710.
Dodge, John H.; and Ernst, Larry M., 4,415,800., Cl. 219-497.000.
Frosch, Albert; Hinkel, Holger; and Kraus, Georg, 4,415,942., Cl. 360-135.000.
Giordano, Francis P.; and Henshaw, Robert J., 4,415,914., Cl. 346-154.000.
Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, 4,415,634., Cl. 428-579.000.
Horvath, Joseph L., 4,415,025., Cl. 165-185.000.
Houser, David E.; Kohn, Harold; and Williams, Gordon L., 4,415,113., Cl. 227-130.000.
Langner, Guenther O.; and Pfeiffer, Hans C., 4,415,851., Cl. 324-51.000.
Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., 4,415,905., Cl. 346-1.100.

International Computers Limited: *See—*
Evans, Colin, 4,415,973., Cl. 364-200.000.

International Harvester Co.: *See—*
Salva, Henri E., 4,415,040., Cl. 172-225.000.

International Standard Electric Corporation: *See—*
Elsasser, Kurt; Ebner, Helmut; and Baumgartner, Armin, 4,415,642., Cl. 430-86.000.
Riegl, Ivan, 4,415,404., Cl. 156-635.000.
Vogel, Horst; Idler, Horst; and Taruttis, Arno H., 4,415,899., Cl. 343-413.000.
Weeks, Ronald D.; and Croney, David J., 4,415,950., Cl. 361-433.000.

International Telephone and Telegraph Corporation: *See—*
Hartley, James T., 4,414,697., Cl. 7-107.000.
Kennedy, Henry R., 4,415,897., Cl. 343-5.0SM.
Sodini, Gregory L., 4,415,837., Cl. 315-177.000.
Young, Kenneth P.; Kyonka, Curtis P.; and Courtois, James A., 4,415,374., Cl. 148-2.000.

Interstate Electronics Corporation: *See—*
Marentic, Michael J., 4,415,892., Cl. 340-767.000.

Inui, Toshiharu; and Moriguchi, Haruhiko, to Fuji Xerox Co., Ltd. Thermal head driving method. 4,415,904., Cl. 346-1.100.

Investment Rarities, Incorporated: *See—*
Burandt, Corliss O., 4,414,931., Cl. 123-90.160.

Iomega Corporation: *See—*
Ballard, Douglas F., 4,415,939., Cl. 360-75.000.

Iqbal, Abul; and Cassar, Luigi, to Ciba-Geigy Corporation. Process for dyeing high-molecular organic material, and novel polycyclic pigments. 4,415,685., Cl. 524-92.000.

Isao, Matsunaga: *See—*
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.

ISCO, Inc.: *See—*
Grant, Douglas M., 4,415,011., Cl. 141-284.000.

Iseki & Co., Ltd.: *See—*
Suzuki, Hisashi, 4,415,451., Cl. 210-610.000.

Isert, Michel: *See—*
Guillemet, Michel J.; and Isert, Michel, 4,415,971., Cl. 364-200.000.

Ishihara Sangyo Kaisha Ltd.: *See—*
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739., Cl. 548-367.000.

Ishihara, Shunichi: *See—*
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920., Cl. 358-37.000.

Ishii, Kinichi, to Kabushiki Kaisha Johnan Seisakusho. Window regulator for an automotive vehicle. 4,414,779., Cl. 49-351.000.

Isobe, Shinichi: *See—*
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,415,977., Cl. 364-474.000.

Itai, Reiichi: *See—*
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,415,411., Cl. 204-29.000.

Italiano, Victor J.; and Sayko, Steven P., to NCR Corporation. Multiple nozzle ink jet print head. 4,415,909., Cl. 346-140.00R.

Itoh, Hiroshi; and Watanabe, Haruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Idling speed control device of an internal combustion engine. 4,414,942., Cl. 123-339.000.

Itoh, Susumu; and Sawamura, Mitsuharu, to Canon Kabushiki Kaisha. Achromatized beam splitter of low polarization. 4,415,233., Cl. 350-173.000.

ITT Industries, Inc.: *See—*
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210., Cl. 303-116.000.
Reinartz, Hans-Dieter; and Buerger, Magdalene, 4,414,810., Cl. 60-535.000.
Schopper, Bernd, 4,415,209., Cl. 303-6.00C.

Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator. Apparatus for chlorination of molten magnesium chloride salts. 4,415,538., Cl. 422-224.000.

Ive, John G. S.; and Thirlwall, Alan C., to Sony Corporation. Random access memory arrangements. 4,415,994., Cl. 365-189.000.

Iwahama, Takeshi: *See—*
Ushirokawa, Masahiro; Iwahama, Takeshi; and Senda, Kenichi, 4,415,680., Cl. 521-56.000.

Iwai, Fumio: *See—*
Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, 4,415,308., Cl. 415-72.000.

Iwakura, Sadao, to Canon Kabushiki Kaisha. Character generator capable of storing character patterns at different addresses. 4,415,890., Cl. 340-749.000.

Iwasa, Tatsuya; Inoue, Takayuki; and Mizuta, Noriyuki, to Mitsubishi Denki Kabushiki Kaisha. Wire harness. 4,415,765., Cl. 174-72.00A.

Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Torque sensor. 4,414,855., Cl. 73-862.360.

Iwata, Atsushi: *See—*
Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, 4,415,882., Cl. 340-347.0AD.

Iwata, Michitaka: *See—*
Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, 4,415,726., Cl. 528-272.000.

Izumitani, Tetsuro: *See—*
Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,415,464., Cl. 252-62.510.

J. M. Voith GmbH: *See—*
Schiel, Christian; and Wolf, Robert, 4,414,890., Cl. 100-162.00B.

Jackson, W. Shaun. Article carrier apparatus. 4,415,105., Cl. 224-41.000.

Jacob Schlaepfer & Co. AG: *See—*
Schlaepfer, Robert J., 4,415,623., Cl. 428-200.000.

Jacobson, Jeff A.; and Valle, Louis G. Siphon. 4,414,997., Cl. 137-151.000.

Jacoby, Richard P.: *See—*
Farino, Frank G.; and Jacoby, Richard P., 4,414,964., Cl. 128-81.00R.

Jagenberg Werke AG: *See—*
Heymanns, Willi, 4,415,128., Cl. 242-66.000.

Jahoda, Stanislav, to Ustav Pro Vyzkum Motorovych Vozidel. Method of and apparatus for preparing a fuel mixture for an internal combustion engine. 4,414,939., Cl. 123-274.000.

Jain, Pawan K.: *See*—
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,415,506., Cl. 260-986.000.

James, David E.: *See*—
Puskas, Imre; and James, David E., 4,415,479., Cl. 502-85.000.

James Dole Corporation: *See*—
Pohorski, Daniel W., 4,415,539., Cl. 422-304.000.

James, Kristi L., to Motorola, Inc. Bonding means and method. 4,415,115., Cl. 228-170.000.

Janakiraman, Ramachandran; Buckley, Douglas I.; Yamashiro, Donald H.; and Hagman, James R. Biologically active analogs of ACTH and radioimmuno assay therefor. 4,415,546., Cl. 424-1.100.

Janc, Robert V.: *See*—
Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,416,017., Cl. 375-99.000.

Janick, Jan M.: *See*—
Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,415,781., Cl. 200-5.00A.

Janome Sewing Machine Co. Ltd.: *See*—
Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, 4,414,908., Cl. 112-169.000.

Janotik, Adam M.; and Kazyak, Lawrence P., to Ford Motor Company. Machine tool insert dispenser. 4,414,733., Cl. 29-568.000.

Jansen, Jan W.: *See*—
Beuse, Robert H. J.; van Iterson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., 4,415,279., Cl. 374-204.000.

Janzen, Harlo W. Pipe thread protector device. 4,415,005., Cl. 138-96.00T.

Japan Carlit Co., Ltd., The: *See*—
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,415,411., Cl. 204-29.000.

Japan Styrene Paper Corporation: *See*—
Komori, Tetsuo, 4,415,392., Cl. 156-244.130.

Jarsen, Manfred H., to Discovision Associates. Elastomeric videodisc mold. 4,415,138., Cl. 249-114.00R.

Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., to Motorola, Inc. Apparatus and method for attenuating interfering signals. 4,416,017., Cl. 375-99.000.

Jelks, Edward C.; Kerber, George L.; and Wilcox, Howard A., to United States of America, Navy. Optical lithographic technique for fabricating submicron-sized Josephson microbridges. 4,414,738., Cl. 29-579.000.

Jenn-Air Corporation: *See*—
Field, Thomas R., 4,415,788., Cl. 219-10.49R.

Jennings, Alan K., to Printronix, Inc. Variable print density encoder system. 4,415,286., Cl. 400-279.000.

Jensen, Flemming E. Magnetic kinetic amusement device. 4,414,775., Cl. 46-241.000.

Jernigan, Robert T., to Dow Chemical Company, The. Purifying geothermal steam. 4,414,817., Cl. 60-641.200.

Jewer, Alan A.: *See*—
Ackerman, Richard C.; Jewer, Alan A.; and Hurlbut, Donovan W., 4,416,001., Cl. 369-44.000.

Jidosha Kiki Co., Ltd.: *See*—
Masuda, Naosuke; Ohe, Takeshi; and Fujii, Tadaaki, 4,415,319., Cl. 418-135.000.

Jin, Sungho; and Tiefel, Thomas H., to Bell Telephone Laboratories, Incorporated. Method for making a high remanence Fe-Mo-Ni magnetic element. 4,415,380., Cl. 148-101.000.

Jing, Li G. Ice rink refrigerant distribution means. 4,414,821., Cl. 62-235.000.

Joh, Yasushi, to Nippon Zeon Co., Ltd. Non-thrombogenic material. 4,415,490., Cl. 525-54.200.

Johannsmeier, Karl-Heinz, to Optimetrix Corporation. Alignment and exposure system with an indicium of an axis of motion of the system. 4,414,749., Cl. 33-180.00R.

Johansson, Arne; Larsson, Torsten; and Nilsson, Ove, to Aktiebolaget Bofors. Wear parts system. 4,414,764., Cl. 37-141.00T.

John, Phillip M.: *See*—
Yu, Andrew B. C.; and John, Phillip M., 4,415,547., Cl. 424-19.000.

John Wyeth and Brother Limited: *See*—
Crossley, Roger, 4,415,579., Cl. 424-263.000.
Crossley, Roger; and Dickinson, Kay H., 4,415,582., Cl. 424-267.000.

Johnson, Douglas J. Device for cleaning a hose coupling. 4,414,701., Cl. 15-105.000.

Johnson, Gordon G.: *See*—
Esmay, Donald L.; Johnson, Gordon G.; and Vesley, George F., 4,415,615., Cl. 428-40.000.

Johnson & Johnson: *See*—
Korpman, Ralf, 4,415,388., Cl. 156-78.000.

Johnson & Johnson Products, Inc.: *See*—
Yost, Kevin G., 4,414,990., Cl. 132-91.000.

Johnson, Norman E., to EG & G Sealol, Inc. Method and device for aligning and securing a mechanical seal element and the like on a shaft. 4,415,164., Cl. 277-1.000.

Johnson, Peter D.: *See*—
Griffing, Bruce F.; Johnson, Peter D.; and Johnson, Roger N., 4,415,955., Cl. 362-225.000.

Johnson, Roger N.: *See*—
Griffing, Bruce F.; Johnson, Peter D.; and Johnson, Roger N., 4,415,955., Cl. 362-225.000.

Johnson, Walter R., to Combustion Engineering, Inc. Electrical insulating refractory composition. 4,415,674., Cl. 501-104.000.

Johnston, James P.: *See*—
Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906., Cl. 346-74.500.

Johnstone, Theodore R.; and Kaatz, James P., to Johnstone, Theodore R.; Kaatz, James P.; and Moon, Edward T., a part interest. Shaking apparatus. 4,414,795., Cl. 56-328.0TS.

Jones, Charles U.: *See*—
Mainwaring, David E.; and Jones, Charles U., 4,415,335., Cl. 44-1.00C.

Jones, David N., to Union Carbide Corporation. Process for forming film from low strain hardening polymers. 4,415,711., Cl. 526-88.000.

Jones, James E.: *See*—
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666., Cl. 435-179.000.

Jones, Richard E., III: *See*—
Mauldin, Donald M.; and Jones, Richard E., III, 4,414,965., Cl. 128-87.00R.

Jordan, Ernst G., to OBO Bettermann OHG. Electrical stud welding device for welding studs of different diameters without pre-testing adjusting welds. 4,415,792., Cl. 219-98.000.

Jorgensen, Arne R. Gear burnishing and honing machine. 4,414,780., Cl. 51-26.000.

Jorgensen, Theodore P. Matched set of golf clubs. 4,415,156., Cl. 273-77.00A.

Joy Manufacturing Company: *See*—
Baker, Robert L., 4,415,024., Cl. 165-160.000.

Joyce, Cathy L.; and Zaneveld, Lourens J. D., to University of Illinois Foundation. Contraceptive method. 4,415,585., Cl. 424-273.00P.

Jurgens, Rainer, to Christensen, Inc. Down hole motor. 4,415,316., Cl. 418-48.000.

Jurgens, Rainer, to Christensen, Inc. Generator for the production of electrical energy. 4,415,823., Cl. 310-87.000.

K-Line Industries, Inc.: *See*—
Kammeraad, James A.; and Tiger, Ronald L., 4,414,723., Cl. 29-26.00A.

Kaatz, James P.: *See*—
Johnstone, Theodore R.; and Kaatz, James P., 4,414,795., Cl. 56-328.0TS.

Kabbe, Hans-Joachim, to Bayer Aktiengesellschaft. Chroman-4-ones and process for preparing same. 4,415,741., Cl. 549-345.000.

Kabushiki Kaisha Advance Kaihatsu Kenkyujo: *See*—
Yagi, Michiko, 4,414,988., Cl. 131-334.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Ikehata, Yukio; and Ono, Kenichi, 4,415,276., Cl. 368-187.000.

Kabushiki Kaisha Higashifuji Seisakusho: *See*—
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785., Cl. 200-38.00B.

Kabushiki Kaisha Johnan Seisakusho: *See*—
Ishii, Kinichi, 4,414,779., Cl. 49-351.000.

Kabushiki Kaisha Orii Jidoki Seisakusho: *See*—
Orii, Takeshi, 4,414,887., Cl. 100-45.000.

Kabushiki Kaisha Tokyo Kikai Seisakusho: *See*—
Sato, Masayoshi; and Suzuki, Kunio, 4,414,897., Cl. 101-216.000.

Kaczensky, Friedrich; Kroy, Walter; and Reithmeier, Gunter, to Messerschmitt-Boelkow-Blohm GmbH. Radiation shutter, especially for a laser. 4,415,231., Cl. 350-269.000.

Kadija, Igor V., to Olin Corporation. Electrochemical depyrophorization of raney nickel electrodes. 4,415,416., Cl. 204-147.000.

Kadnikova, Galina I.: *See*—
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550., Cl. 424-57.000.

Kaepa, Inc.: *See*—
Faiella, James, 4,414,760., Cl. 36-29.000.

Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, to Fujitsu Limited. Method of beryllium implantation in germanium substrate. 4,415,370., Cl. 148-1.500.

Kai, Tomokazu; and Nakahara, Hidetoshi, to Nippon Electric Co., Ltd. Malfunction detection system for a mobile radio telephone system. 4,415,770., Cl. 179-2.0EB.

Kai, Toshio: *See*—
Tanaka, Junzo; Kai, Toshio; and Fujitani, Yoshitomo, 4,415,799., Cl. 219-400.000.

Kainer, Carl E., to Deere & Company. Coupler latch mechanism with a self-opening feature. 4,415,175., Cl. 280-460.00A.

Kajimoto, Takeshi: *See*—
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050., Cl. 180-6.480.

Kajita, Isamu: *See*—
Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643., Cl. 430-94.000.

Kajita, Koji: *See*—
Nakayama, Takashi; Yamagata, Seiichi; and Kajita, Koji, 4,414,800., Cl. 57-236.000.

Kalal, Jaroslav: *See*—
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.

Kalejs, Juris P.: *See*—
Wald, Fritz; and Kalejs, Juris P., 4,415,401., Cl. 156-608.000.

Kaleskas, Edward W.: *See*—
Paradis, Joseph R.; and Kaleskas, Edward W., 4,415,003., Cl. 137-843.000.

Kali-Chemie Pharma GmbH: *See*—
Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,415,577., Cl. 424-258.000.
Kallay, Maria: *See*—
Buhler, Ulrich; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,415,494., Cl. 260-196.000.
Kaloi, Cyril M., to United States of America, Navy. Cavity/microstrip multi-mode antenna. 4,415,900., Cl. 343-700.0MS.
Kalt, Evelyne: *See*—
Avar, Lajos; Kalt, Evelyne; and Reinshagen, Hellmuth, 4,415,687., Cl. 524-102.000.
Kamat, Dattatraya V., to Kayser-Roth Corporation. Fusible interlining of improved bond strength and dry cleaning resistance. 4,415,622., Cl. 428-198.000.
Kammeraad, James A.; and Tiger, Ronald L., to K-Line Industries, Inc. Adjustable cylinder head holder. 4,414,723., Cl. 29-26.00A.
Kamyr, Inc.: *See*—
Funk, Erwin D., 4,415,296., Cl. 406-19.000.
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, to Japan Carlit Co., Ltd., The. Anode coated with β-lead dioxide and method of producing same. 4,415,411., Cl. 204-29.000.
Kaneda, Takao: *See*—
Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370., Cl. 148-1.500.
Kanegafuchi Chemical Industry Company, Limited: *See*—
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657., Cl. 435-106.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,415,708., Cl. 525-316.000.
Ushirokawa, Masahiro; Iwahama, Takeshi; and Senda, Kenichi, 4,415,680., Cl. 521-56.000.
Kant, Rishi, to Bell Telephone Laboratories, Incorporated. Compliant contact pin. 4,415,220., Cl. 339-221.00R.
Kaplan, Leonard, to Union Carbide Corporation. Process for making ethylene glycol derivatives. 4,415,747., Cl. 560-112.000.
Kappen, Burkhard. Roof truss assemblies for hipped roofs, and method of manufacturing same. 4,414,787., Cl. 52-643.000.
Karabinis, Peter D., to Bell Telephone Laboratories, Incorporated. Adaptive equalizer. 4,415,872., Cl. 333-18.000.
Karasaki, Toshihiko; Gotoh, Takayuki; Namba, Yasuhiro; and Yamakawa, Eiji, to Minolta Camera Kabushiki Kaisha. Focus detecting device. 4,415,246., Cl. 354-25.000.
Karavassileff, Todor Y.: *See*—
Zhabilov, Harry P.; and Karavassileff, Todor Y., 4,415,553., Cl. 424-95.000.
Karavolis, Sam: *See*—
Setzer, Herbert J.; Lesieur, Roger R.; and Karavolis, Sam, 4,415,484., Cl. 502-332.000.
Karl Mayer Textilmaschinfabrik, GmbH: *See*—
Mista, Kresimir; and Englert, Norbert, 4,414,826., Cl. 66-207.000.
Karwan, Mitchell S.: *See*—
Wong, Alan S.; Karwan, Mitchell S.; and Germane, Keith L., 4,414,981., Cl. 128-712.000.
Kasai, Shin: *See*—
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126., Cl. 242-43.00R.
Kassakian, John G., to Massachusetts Institute of Technology. Current mode sine wave inverter. 4,415,962., Cl. 363-131.000.
Kastar, Inc.: *See*—
Epstein, Harry, 4,414,698., Cl. 7-170.000.
Kastelic, Frank M., Jr., to Falk, Kastelic, Heartwell, Inc. Lock system for removable automobile roofs. 4,415,189., Cl. 292-196.000.
Kasuga, Muneo; Miyashita, Kiyoshi; and Nishikawa, Masaji, to Olympus Optical Company Limited. Duplicating system comprising electrophotographic copier and option device. 4,415,260., Cl. 355-14.0SH.
Kato, Atsumi: *See*—
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, 4,415,713., Cl. 526-125.000.
Kato Hatsujo Kaisha, Ltd.: *See*—
Kodama, Yutaka; and Miyoshi, Masakazu, 4,415,192., Cl. 292-347.000.
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, to Ibiden Co., Ltd. Apparatus for refining metal carbides containing free carbon. 4,415,535., Cl. 422-143.000.
Kato, Masateru: *See*—
Takemori, Toshio; Kato, Masateru; and Masuda, Fumio, 4,415,595., Cl. 426-101.000.
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, to Canon Kabushiki Kaisha. Image signal processing unit. 4,415,920., Cl. 358-37.000.
Katoh, Heizaburou, to Sankyo Manufacturing Company, Ltd. Roll feed apparatus. 4,415,108., Cl. 226-138.000.
Katsuki, Shogo: *See*—
Inoue, Nori; and Katsuki, Shogo, 4,415,221., Cl. 339-258.00F.
Katumata, Saichi: *See*—
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785., Cl. 200-38.00B.
Kaufman, Benjamin J., to Texaco Inc. Method for preparing a lactone reaction product. 4,415,740., Cl. 549-273.000.
Kauric, Charles E.: *See*—
Dailey, George F.; and Kauric, Charles E., 4,415,825., Cl. 310-270.000.
Kavaloski, Peter P.: *See*—
Hale, Thomas K.; and Kavaloski, Peter P., 4,415,177., Cl. 280-650.000.
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Photoelectric transducer device. 4,415,924., Cl. 358-50.000.
Kawaguchi, Yutaka: *See*—
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126., Cl. 242-43.00R.
Kawaharada, Hajime: *See*—
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657., Cl. 435-106.000.
Kawai, Hisasi: *See*—
Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, 4,414,847., Cl. 73-204.000.
Kawamura, Naoto: *See*—
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920., Cl. 358-37.000.
Kawanishi, Toshiyuki; and Tabata, Yukio, to Ricoh Co., Ltd. Electric ink transfer recording method. 4,415,903., Cl. 346-1.100.
Kawasaki Steel Corporation: *See*—
Ebata, Sadao, 4,415,143., Cl. 266-112.000.
Kawase, Yoshitaka, to Sharp Kabushiki Kaisha. Magnetron fault alarm in a microwave oven. 4,415,887., Cl. 340-635.000.
Kawashima, Hirokuni: *See*—
Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643., Cl. 430-94.000.
Kaydee Engineering, Inc.: *See*—
Rosenberger, Leonard S., 4,415,018., Cl. 165-41.000.
Kayser-Roth Corporation: *See*—
Kamat, Dattatraya V., 4,415,622., Cl. 428-198.000.
Kazyak, Lawrence P.: *See*—
Janotik, Adam M.; and Kazyak, Lawrence P., 4,414,733., Cl. 29-568.000.
KCL Corporation: *See*—
Ferrell, Robert A.; and Robinette, James A., 4,415,386., Cl. 156-64.000.
Keck, Donald B., to Corning Glass Works. Polarization retaining single-mode optical waveguide. 4,415,230., Cl. 350-96.330.
Keeffe, William M.: *See*—
Rothwell, Harold L., Jr.; English, George J.; and Keeffe, William M., 4,415,829., Cl. 313-621.000.
Keenan, James P., to GTE Products Corporation. Tungsten halogen lamp containing cyanogen. 4,415,834., Cl. 313-578.000.
Kehrbach, Wolfgang: *See*—
Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,415,577., Cl. 424-258.000.
Keilly, Ronald J.: *See*—
Pochurek, Gerald M.; and Keilly, Ronald J., 4,415,518., Cl. 264-166.000.
Keller, Hans-Peter; and Bossard, Max, to Loepfe Brothers Limited. Device for monitoring the weft thread travel on an air jet weaving machine. 4,415,008., Cl. 139-370.200.
Kelly, Harry C. Flavor injector. 4,414,885., Cl. 99-494.000.
Kelly, John W., to Haskel, Incorporated. Apparatus for hydraulically forming joints between tubes and tube sheets. 4,414,739., Cl. 29-727.000.
Kelly, T. Ross: *See*—
Anathasubramanian, Lakshminarayan; Kelly, T. Ross; and Vaya, Jacob, 4,415,498., Cl. 260-351.100.
Kemkers, Pieter, to U.S. Philips Corporation. Packing for a stack of electrical and/or electronic parts. 4,415,083., Cl. 206-334.000.
Kenan, Richard P.: *See*—
Verber, Carl M.; and Kenan, Richard P., 4,415,226., Cl. 350-96.140.
Kennecott Corporation: *See*—
Richmond, Wesley Q., 4,415,510., Cl. 264-8.000.
Kennedy, Henry R., to International Telephone and Telegraph Corporation. Precision control of RF attenuators for STC applications. 4,415,897., Cl. 343-5.0SM.
KenoGard AB: *See*—
Lundin, Claes O. A.; and Simonsson, Berit I., 4,415,716., Cl. 526-209.000.
Kent, Preben, to Brunswick Corporation. Pressure rise rate limiter valve. 4,415,001., Cl. 137-497.000.
Keogh, Michael J.: *See*—
Barnabeo, Austin E.; and Keogh, Michael J., 4,415,710., Cl. 525-370.000.
Kerber, George L.: *See*—
Jelks, Edward C.; Kerber, George L.; and Wilcox, Howard A., 4,414,738., Cl. 29-579.000.
Kernforschungsanlage Julich GmbH: *See*—
Luhleich, Hartmut; and Dias, Francisco J., 4,415,632., Cl. 428-408.000.
Protic, Davor; and Riepe, Georg, 4,415,916., Cl. 357-29.000.
Kernstock, John M., to Dow Chemical Company, The. Hydroxyethyl hydroxypropyl cellulose ether thickeners for aqueous coating compositions. 4,415,683., Cl. 524-43.000.
Kerr-McGee Corporation: *See*—
Rhodes, Donald E., 4,415,442., Cl. 208-177.000.
Kerr, Walter B., to United Technologies Corporation. Method and apparatus for controlling a gas turbine engine. 4,414,807., Cl. 60-204.000.

Khristjuk, Grigory P.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.

Kichijyo, Hiroshi. Cap remover. 4,414,866., Cl. 81-3.46R.

Kiczek, Alexander P.; Salmen, Leo A.; and Tower, Clark B., to Colgate Palmolive Company. Process for making high solids content zeolite A-alkylbenzene sulfonate compositions suitable for use in making spray dried detergent compositions. 4,415,489., Cl. 252-558.000.

Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Recording material. 4,415,650., Cl. 430-273.000.

Kiencke, Uwe: *See*—
Honig, Gunther; Kiencke, Uwe; and Schulz, Alfred, 4,414,949., Cl. 123-479.000.

Kieninger & Obergfell Fabrik FuTechnische Laufwerke und Apparate: *See*—
Heinzelmann, Hans, 4,415,272., Cl. 368-69.000.

Kikuchi, Toshiaki: *See*—
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126., Cl. 242-43.00R.

Kim, Yung J., to Baker International Corporation. Seal for concentric tubular member. 4,415,169., Cl. 277-125.000.

Kimoto, Tatsuo: *See*—
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, 4,415,713., Cl. 526-125.000.

Kimura, Shigeru: *See*—
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497., Cl. 260-245.20T.

King Jim Co., Ltd.: *See*—
Ohminato, Kiyoshi, 4,415,290., Cl. 402-26.000.

King, Patrick D.: *See*—
Shapland, Earl P.; and King, Patrick D., 4,415,103., Cl. 222-590.000.

Kinoshita, Akira: *See*—
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59.000.
Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,641., Cl. 430-59.000.

Kinoshita, Takao: *See*—
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924., Cl. 358-50.000.

Kinoshita, Yoshio: *See*—
Shoji, Masao; and Kinoshita, Yoshio, 4,415,072., Cl. 192-45.000.

Kinoyama, Takehisa: *See*—
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,415,620., Cl. 428-157.000.

Kiphart, Lynn R.: *See*—
Denes, Oscar L.; Kiphart, Lynn R.; and Szalewski, Paul P., 4,415,607., Cl. 427-96.000.

Kircher, Dieter: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210., Cl. 303-116.000.

Kirk, David A.: *See*—
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.

Kirkup, Joseph F.; and Horning, Randall A., to Mechanical Products, Inc. Circuit breaker. 4,415,875., Cl. 337-62.000.

Kishima, Yukihiro: *See*—
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka, 4,416,006., Cl. 369-240.000.

Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka. Record disc playing apparatus having the function for correcting rotational irregularities due to record disc eccentricity. 4,416,006., Cl. 369-240.000.

Kitoh, Kyosuke: *See*—
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567., Cl. 424-246.000.

Kitzman, Donald G. Crushing apparatus. 4,414,891., Cl. 100-245.000.

Klasco, Michael A.: *See*—
Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, 4,415,772., Cl. 369-60.000.

Kleemann, Axel: *See*—
Martens, Jurgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738., Cl. 548-147.000.

Klein, Gerald W.; and Bowman, Wayne A., to Eastman Kodak Company. Polymeric vehicle for dye image-receiving layer containing a poly(vinylimidazole) mordant. 4,415,647., Cl. 430-213.000.

Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,415,581., Cl. 424-267.000.

Klein, Pearl M. Flocculating reagents. 4,415,458., Cl. 210-727.000.

Klein, Robert R.; and Makowski, Henry S., deceased (by Makowski, Patricia H., executrix), to Exxon Research and Engineering Co. Process for forming powders from ion containing polymers. 4,415,709., Cl. 525-344.000.

Kleiner, Walter, to Staeubli Ltd. Apparatus for effecting back-and-forth movement of a guide synchronously with the intermittent rotary movement of a shaft. 4,415,007., Cl. 139-329.000.

Kleinschmit, Peter: *See*—
Voigt, Carl; Kleinschmit, Peter; and Manner, Reinhard, 4,415,485., Cl. 502-100.000.

Klepa, Peter P., to UOP Inc. System for automatically dispensing liquid chemicals into an intermittently flowing liquid stream. 4,414,996., Cl. 137-101.270.

Klockner-Humboldt-Deutz AG: *See*—
Gittelbauer, Joachim, 4,414,825., Cl. 62-374.000.

Klotz, Erhard: *See*—
Curth, Claus P.; Tiemens, Ulf; and Klotz, Erhard, 4,416,018., Cl. 378-2.000.
Weiss, Hermann; Linde, Rolf; Mauser, Wilfried; and Klotz, Erhard, 4,416,019., Cl. 378-2.000.

Klotz, Peter; and Bottcher, Henry, to Preussag-Boliden-Blei GmbH. Process and apparatus for removing a layer of fluid on top of a bath. 4,415,144., Cl. 266-228.000.

Klotzner, Winfried: *See*—
Daumer, Rolf; Klotzner, Winfried; and Schenk, Manfred, 4,414,946., Cl. 123-417.000.

Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., to Miles Laboratories, Inc. 15-Deoxy-16-hydroxy prostaglandins for producing bronchodilation. 4,415,592., Cl. 424-331.000.

Knapp, Hans J. Power generator system. 4,414,813., Cl. 60-655.000.

Knappe, Horst, to Knappe, Ilona. Plate for radiant heating or similar effects. 4,415,798., Cl. 219-345.000.

Knappe, Ilona: *See*—
Knappe, Horst, 4,415,798., Cl. 219-345.000.

Knight, George W.: *See*—
Allen, James A.; Knight, George W.; and Edmondson, Morris S., 4,415,691., Cl. 524-114.000.

Knitter, Kathy A.: *See*—
Schick, Martin J.; and Knitter, Kathy A., 4,415,338., Cl. 44-51.000.

Knoblauch, Karl; and Heimbach, Heinrich, to Bergwerksverband GmbH. Adsorptive separation of gases. 4,415,340., Cl. 55-25.000.

Knoll, Peter R., to Dentronix Systems, Inc. Pedestal for consoles. 4,415,136., Cl. 248-181.000.

Knorr-Bremse GmbH: *See*—
Fried, Reinhard; Heller, Rudolf; and Hubner, Heimo, 4,414,952., Cl. 123-559.000.

Kobari, Harukuni: *See*—
Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, 4,416,010., Cl. 371-37.000.

Koch, Edwin R.: *See*—
Glass, Michael; Koch, Edwin R.; and Corsello, Vincent, 4,415,593., Cl. 426-4.000.

Kocks Technik GmbH & Company: *See*—
Holthoff, Helmut, 4,414,859., Cl. 74-417.000.

Kodama, Yutaka; and Miyoshi, Masakazu, to Nissan Motor Co. Ltd.; and Kato Hatsujo Kaisha, Ltd. Door locking knob for vehicle. 4,415,192., Cl. 292-347.000.

Koehn, Gary. Multiple implement towing apparatus. 4,415,174., Cl. 280-411.00C.

Koenig, Horst: *See*—
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571., Cl. 424-250.000.

Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, to Nippon Soken, Inc. Gas flow measuring apparatus. 4,414,847., Cl. 73-204.000.

Kohl, Paul A.: *See*—
Burton, Randolph H.; Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,415,414., Cl. 204-129.300.

Kohler, Helmut: *See*—
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,415,429., Cl. 208-8.0LE.

Kohn, Harold: *See*—
Houser, David E.; Kohn, Harold; and Williams, Gordon L., 4,415,113., Cl. 227-130.000.

Kohnhorst, Earl E.: *See*—
Porenski, Harry S., Jr.; and Kohnhorst, Earl E., 4,414,841., Cl. 73-61.00R.

Koide, Atsushi; and Yoshizawa, Masayuki, to Eisai Co., Ltd. Carboxypeptidase a gamma and process for preparing same. 4,415,667., Cl. 435-212.000.

Koike, Keiichi; and Yanadori, Michio, to Hitachi, Ltd.; and Hitachi Plant Engineering and Construction Co., Ltd. Heat-storing composition. 4,415,465., Cl. 252-70.000.

Koken, Ernest E., to Oscar Mayer & Co., Inc. Sausage casing removal apparatus. 4,414,707., Cl. 17-1.00F.

Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, to Mobil Oil Corporation. Modification of catalytic activity of porous zeolites. 4,415,544., Cl. 423-328.000.

Kolesnik, Analy G.: *See*—
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550., Cl. 424-57.000.

Kollmorgen Technologies Corporation: *See*—
Wedman, Leonard N.; and Bourque, Joseph A., 4,415,821., Cl. 310-12.000.

Koltveit, Arthur O. Jointed tool. 4,414,867., Cl. 81-177.0UJ.

Komenou, Kazunari; Miyashita, Tsutomu; and Ohashi, Makoto, to Fujitsu Limited. Magnetic bubble memory device. 4,415,988., Cl. 365-16.000.

Komori, Tetsuo, to Japan Styrene Paper Corporation. Method for producing foamed plastic sheet. 4,415,392., Cl. 156-244.130.

Kondratenko, Anatoly B.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.

Konishi, Masahiro: *See—*
Nishizawa, Jun-ichi; and Konishi, Masahiro, 4,415,937., Cl. 358-335.000.

Konishi, Motofumi, to Canon Kabushiki Kaisha. Image reading apparatus. 4,415,934., Cl. 358-294.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59.000.
Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,641., Cl. 430-59.000.
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644., Cl. 430-106.600.
Yukawa, Koji; Murahashi, Takashi; and Sakurai, Isao, 4,415,261., Cl. 355-75.000.

Konosu, Osamu, to Matsushita Electronics Corporation. Electromagnetic deflection type picture tube device. 4,415,831., Cl. 313-413.000.

Konstantinov, deceased; Nikolai A.: *See—*
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550., Cl. 424-57.000.

Kool-Fire Limited: *See—*
Vandervaart, Gerry, 4,415,023., Cl. 165-122.000.

Kopp, Walter; Mugrauer, Hubert; and Stuerzer, Anton, to Siemens Aktiengesellschaft. Pressure device for a web-like image-receiving material. 4,415,257., Cl. 355-3.0TR.

Kornfeld, Irwin H.: *See—*
Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, 4,415,772., Cl. 369-60.000.

Korpman, Ralf, to Johnson & Johnson. Method of making absorbent bearing products. 4,415,388., Cl. 156-78.000.

Kosanovich, George M.; and Salee, Gideon, to Occidental Chemical Corporation. Semi or fully continuous process for polyester of bisphenol and dicarboxylic acid by transesterification polymerization and product thereof. 4,415,721., Cl. 528-176.000.

Kosarev, Sergei P.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.

Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of making transistors by ion implantations, electron beam irradiation and thermal annealing. 4,415,372., Cl. 148-1.500.

Kostanecki, Andrew T.; and Mileos, George, to Timex Corporation. Expansible clasp and module for watch straps. 4,414,714., Cl. 24-265.0WS.

Kosubek, Uwe: *See—*
Buhler, Ulrich; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,415,494., Cl. 260-196.000.

Kouchi, Toshihiro; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Developer for electrophotography and process for preparation thereof. 4,415,645., Cl. 430-107.000.

Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., to Goodyear Tire & Rubber Company, The. Tire dynamic imbalance screening system. 4,414,843., Cl. 73-66.000.

Kowa Co., Ltd.: *See—*
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497., Cl. 260-245.20T.

Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, to Hitachi, Ltd. Photomask. 4,415,262., Cl. 355-125.000.

Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with acylated imidazolyl-gamma-fluoropinacolyl derivatives. 4,415,586., Cl. 424-273.00R.

Kraus, Georg: *See—*
Frosch, Albert; Hinkel, Holger; and Kraus, Georg, 4,415,942., Cl. 360-135.000.

Kraus, Josef; and Wech, Erich, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Non-leaking printing ink trough. 4,414,900., Cl. 101-363.000.

Krause, Werner, to Hoechst Aktiengesellschaft. Process for making alkyl or arylthiophosphonic acid. 4,415,505., Cl. 260-543.00P.

Kravitz, Roy H.: *See—*
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969., Cl. 364-200.000.

Kreftmeyer, James R.: *See—*
Hadler, Howard D.; and Kreftmeyer, James R., 4,415,043., Cl. 172-776.000.

Kreinberg, Manfred; and Petzold, Lothar, to Herbert Kannegiesser GmbH & Co. Steam mangle with heat recycling to predryer. 4,414,765., Cl. 38-54.000.

Kreutzev, Hans; and Mattuschka, Werner, to Siemens Aktiengesellschaft. Support and connection device for a disc-shaped piezoelectric resonator. 4,415,826., Cl. 310-354.000.

Krivonos, Vadim P.: *See—*
Podola, Nikolai V.; Kuchuk-Yatsenko, Sergei I.; Krivonos, Vadim P.; and Grabchev, Boris L., 4,415,793., Cl. 219-110.000.

Kroon, Hendrik A., to H. A. Kroon B.V. Method of purifying soil polluted by oil. 4,415,368., Cl. 134-10.000.

Krowech, Robert J.: *See—*
Csathy, Denis G.; and Krowech, Robert J., 4,414,923., Cl. 122-7.00R.

Kroy Inc.: *See—*
Paque, Michael W., 4,415,395., Cl. 156-384.000.

Kroy, Walter: *See—*
Kaczensky, Friedrich; Kroy, Walter; and Reithmeier, Gunter, 4,415,231., Cl. 350-269.000.

Krueger, Gordon P.; and Lund, Anders E., to Michigan Technological University, Board of Control of. Method and apparatus for making aligned flake composite wood material including integral baffles. 4,415,516., Cl. 264-112.000.

Krumpelt, Michael: *See—*
Vandegrift, George F.; Krumpelt, Michael; and Horwitz, E. Philip, 4,415,412., Cl. 204-67.000.

Kubota, Ltd.: *See—*
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050., Cl. 180-6.480.

Kubota, Yuichi; Nishimatsu, Masaharu; and Tanaka, Kazushi, to TDK Electronics Co., Ltd. Process of making magnetic recording medium. 4,415,630., Cl. 428-403.000.

Kuchuk-Yatsenko, Sergei I.: *See—*
Podola, Nikolai V.; Kuchuk-Yatsenko, Sergei I.; Krivonos, Vadim P.; and Grabchev, Boris L., 4,415,793., Cl. 219-110.000.

Kudelski, Stefan; and Schlup, Jean-Claude, to Robert Bosch GmbH. Recording method and recording apparatus to record, on a grey scale, representations of images under control of electrical command signals. 4,415,912., Cl. 346-154.000.

Kudo, Hideki: *See—*
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, 4,415,877., Cl. 338-34.000.

Kuehl, Ulrich: *See—*
Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,415,577., Cl. 424-258.000.

Kuenzel, Ulrich: *See—*
Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, 4,415,634., Cl. 428-579.000.

Kuhl, Virgil F.; and White, Gary J., to Motorola, Inc. Connector with removal stress relief construction. 4,415,219., Cl. 339-195.00M.

Kuhlmann, Gerhard; and Wolf, Erwin, to Robert Bosch GmbH. Guiding arrangement for a hand tool. 4,414,745., Cl. 30-373.000.

Kulka, Raymond J.; and Trzyna, William A., to Zenith Radio Corporation. Television receiver start-up circuit. 4,415,842., Cl. 315-411.000.

Kumaki, Takashi: *See—*
Saito, Takashi; and Kumaki, Takashi, 4,416,004., Cl. 369-77.200.

Kumano, Isamu, to Yoshida Kogyo K. K. Separable slide fastener. 4,414,718., Cl. 24-396.000.

Kumazawa, Toshihiko: *See—*
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,415,508., Cl. 261-114.00R.

Kunugi, Yoshiro, to Pioneer Electronic Corporation. Pulse width modulation amplifier. 4,415,862., Cl. 330-10.000.

Kunz, Raymond W., to Clairol Incorporated. Massage devices. 4,414,963., Cl. 128-60.000.

Kurotori, Tsuneo; Mochizuki, Manabu; and Tatsumi, Susumu, to Ricoh Co., Ltd. Process for treating exhaust gas from electrophotographic machine and apparatus thereof. 4,415,533., Cl. 422-4.000.

Kusumi, Katsuaki: *See—*
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,415,965., Cl. 364-136.000.

Kusunoki, Shigeru: *See—*
Nobue, Tomotaka; and Kusunoki, Shigeru, 4,415,789., Cl. 219-10.55B.

Kutta, Helmuth W.; and Wunderlich, Donald K., to Atlantic Richfield Company. Method for producing agglomerate particles from an aqueous feed slurry comprising finely divided coal and finely divided inorganic solids. 4,415,337., Cl. 44-24.000.

Kwiatek, Jack; and Brima, Thomas S., to National Distillers and Chemical Corporation. Mixed metal oxide catalyst containing titanium, boron and molybdenum values. 4,415,475., Cl. 502-206.000.

Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, to Canon Kabushiki Kaisha. Residual ink detection mechanism. 4,415,886., Cl. 340-618.000.

Kyonka, Curtis P.: *See—*
Young, Kenneth P.; Kyonka, Curtis P.; and Courtois, James A., 4,415,374., Cl. 148-2.000.

Kyowa Chemical Industry C. Ltd.: *See—*
Anabuki, Hitoshi; and Miyata, Shigeo, 4,415,555., Cl. 424-147.000.

La Telemecanique Electrique: *See—*
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004., Cl. 137-884.000.
Periot, Jean-Marie, 4,415,945., Cl. 361-100.000.

Laauwe, Robert H., to Essex Chemical Corporation. Right-angle spray nozzle. 4,415,122., Cl. 239-327.000.

La Barbera, Ronald S.: *See*—
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,415,506., Cl. 260-986.000.

Laboratoire Suisse de Recherches Horlogeres: *See*—
Niederhaeuser, Paul; Maillat, Michel; and Hintermann, Hans E., 4,415,419., Cl. 204-192.00C.

Labrude, Jacques R.: *See*—
Turre, Gilles H. J.; Hours, Michel; and Labrude, Jacques R., 4,415,418., Cl. 204-180.00G.

Lachmann, Leonard P.; and Garza, Cesario S., Jr., to Texas Instruments Incorporated. System and method for aligning a display device. 4,415,983., Cl. 364-708.000.

Lacoste, Jean-Andre; Leveque, Jeaqn-Pierre; and Schley, Robert, to Commissariat a l'Energie Atomique. Process for making a joint between two metal wires and a differential thermocouple. 4,415,758., Cl. 136-233.000.

Lahr, Robert G., to Ideal Toy Corporation. Two-way slotless road racing game. 4,415,157., Cl. 273-86.00B.

Lai, John T.; and Son, Pyong N., to B. F. Goodrich Company, The. UV-Light stabilized compositions containing substituted 1,5-diazacycloalkanes. 4,415,684., Cl. 524-92.000.

Lai, Juey H.; Douglas, Richard; and Shepherd, Lloyd, to Honeywell Inc. Method of making sensitive positive electron beam resists. 4,415,653., Cl. 430-296.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Contal, Francois; and Boyer, Bernard, 4,414,819., Cl. 62-222.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,414,754., Cl. 33-363.00K.

Lamarche, Dominique: *See*—
Malinge, Jean L.; Soster, Marie C.; and Lamarche, Dominique, 4,415,347., Cl. 65-4.210.

Lamb, Herbert J. Game apparatus. 4,415,160., Cl. 273-243.000.

Landsness, Clifford A.: *See*—
Barnes, Thomas E.; and Landsness, Clifford A., 4,414,874., Cl. 83-488.000.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Reversible phase change compositions of calcium chloride hexahydrate with potassium chloride. 4,415,466., Cl. 252-70.000.

Langenberg, Anthony J., to Black & Decker Inc. Direct drive system for a turbine sander. 4,414,782., Cl. 51-170.0MT.

Langenberg, Anthony J.: *See*—
Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodcwsky, Stanley, Jr., 4,414,781., Cl. 51-170.0MT.

Langenfeld, Joseph W.: *See*—
Westendorf, Neal W.; and Langenfeld, Joseph W., 4,415,303., Cl. 414-519.000.

Langner, Guenther O.; and Pfeiffer, Hans C., to International Business Machines Corporation. System for contactless testing of multi-layer ceramics. 4,415,851., Cl. 324-51.000.

Lapeyre, James M., to Laitram Corporation, The. High resolution compass card position decoder. 4,414,754., Cl. 33-363.00K.

Larikka, Leo, to G. A. Serlachius Oy. Flange forming drill apparatus. 4,414,835., Cl. 72-71.000.

Larkin, John M., to Texaco Inc. Nitriles and primary amines from primary alcohols. 4,415,755., Cl. 564-480.000.

Larsson, Torsten: *See*—
Johansson, Arne; Larsson, Torsten; and Nilsson, Ove, 4,414,764., Cl. 37-141.00T.

Laruelle, Claude; and Lepant, Marcel, to S. A. Panmedica. Scluble N_2 substituted derivatives of 2,4-diamino 5-benzyl pyrimidine, process for their preparation and medicaments containing them. 4,415,574., Cl. 424-251.000.

Laug, Owen B.; Gordon, Charles C.; and Stone, Robert O., to United States of America, Navy. Airspeed display scale with integral trend indication. 4,415,974., Cl. 364-426.000.

Lawrence, Frederick R., to Du Pont de Nemours, E. I., and Company. Process for preparing aniline. 4,415,754., Cl. 564-423.000.

Lechner, Robert; and Wintzer, Klaus, to Siemens AG. Digital-to-analog converter. 4,415,881., Cl. 340-347.0AD.

Lechner, Uwe: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,415,566., Cl. 424-246.000.

Lederich, Richard J.; and Sastry, Shankar M., to McDonnell Douglas Corporation. Transient titanium alloys. 4,415,375., Cl. 148-11.50F.

Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Removal of sulfate ions from brine using composite of polymeric zirconium hydrous oxide in macroporous matrix. 4,415,677., Cl. 521-28.000.

Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Removal of sulfate ions from brine using amorphous polymeric zirconium oxide formed within a macroporous polymer matrix. 4,415,678., Cl. 521-28.000.

Lee, Julian J. L.: *See*—
Dilley, David R.; Lee, Julian J. L.; and Saltveit, Mikal E., Jr., 4,414,839., Cl. 73-23.000.

Lee, Wai-Tak P.: *See*—
Gergis, Isoris S.; and Lee, Wai-Tak P., 4,415,990., Cl. 365-41.000.

Legendarme, Bernard: *See*—
Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753., Cl. 33-356.000.

Leggett & Platt, Incorporated: *See*—
Bustos, Rafael T., 4,415,090., Cl. 211-49.00S.

Legille, Edouard: *See*—
Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358., Cl. 75-58.000.

Lehmann, Hans D.: *See*—
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571., Cl. 424-250.000.

Lehnert, Stanley E., to Zenith Radio Corporation. Method of manufacture for projection television system. 4,415,348., Cl. 65-58.000.

Leinenger, John T., to Modular Automation, Inc. Workpiece support bearing for modular chuting. 4,415,074., Cl. 193-37.000.

Leirnes, Johan S.; and Lundstrom, Malkolm S., to Boliden Aktiebolag. Method for working-up metal-containing waste products. 4,415,360., Cl. 75-65.00R.

Lemaire, Francis: *See*—
Valiot, Catherine; Lemaire, Francis; and Gaussens, Gilbert, 4,415,603., Cl. 427-54.100.

Lemke, Manfred: *See*—
Andersen, Geert; and Lemke, Manfred, 4,415,596., Cl. 426-103.000.

Lemstra, Pieter J.: *See*—
Dorrestijn, Antoon; Lemstra, Pieter J.; and van Unen, Lambert H. T., 4,415,514., Cl. 264-53.000.

Lenglet, Paul: *See*—
Nicolas, Jacques; and Lenglet, Paul, 4,414,833., Cl. 72-13.000.

Lenke, Dieter: *See*—
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, 4,415,571., Cl. 424-250.000.

Lennartz, Rudiger; and Gutermuth, Joachim, to Boll & Kirch Filterbau GmbH. Flush-back filter. 4,415,448., Cl. 210-333.100.

Lenox, Ronald S.; and Hoyle, Charles E., to Armstrong World Industries, Inc. Development of color in a polyamide textile material with aminobenzenesulfonyl azides. 4,415,332., Cl. 8-444.000.

Lenox, Ronald S.: *See*—
Hoyle, Charles E.; and Lenox, Ronald S., 4,415,334., Cl. 8-694.000.

Lepant, Marcel: *See*—
Laruelle, Claude; and Lepant, Marcel, 4,415,574., Cl. 424-251.000.

Leppanen, Olavi A.: *See*—
Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapolku, Pertti J., 4,415,659., Cl. 435-161.000.

Lesea, Ronald A. Electronic ballast for gaseous discharge lamps. 4,415,839., Cl. 315-308.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. Cardiotonic 3-methyl-4-(4-pyridinyl)benzeneamine compositions and method of use. 4,415,578., Cl. 424-263.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. Certain 2-(1H)-pyridinones cardiotonic compositions containing same and method of using same. 4,415,580., Cl. 424-263.000.

Lesieur, Roger R.: *See*—
Setzer, Herbert J.; Lesieur, Roger R.; and Karavolis, Sam, 4,415,484., Cl. 502-332.000.

Letzsch, Warren S.: *See*—
Dean, Robert R.; Letzsch, Warren S.; and Mauleon, Jean L., 4,415,438., Cl. 208-120.000.

Leveque, Alain: *See*—
Salomon, Georges P. J.; and Leveque, Alain, 4,414,762., Cl. 36-117.000.

Leveque, Jeaqn-Pierre: *See*—
Lacoste, Jean-Andre; Leveque, Jeaqn-Pierre; and Schley, Robert, 4,415,758., Cl. 136-233.000.

Lewis Engineering Company, The: *See*—
Dubauskas, Thomas A., 4,415,855., Cl. 324-114.000.

Lewis, Henry G., Jr., to RCA Corporation. Digital color television signal demodulator. 4,415,918., Cl. 358-23.000.

Lewis, William E., to Exxon Research and Engineering Co. Catalytic reforming process. 4,415,435., Cl. 208-65.000.

Li, Norman N.: *See*—
Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,415,426., Cl. 204-290.00R.

Licentia Patent-Verwaltungs-GmbH: *See*—
Unger, Hans-Georg, 4,415,227., Cl. 350-96.150.
Wermuth, Jurgen, 4,415,866., Cl. 330-278.000.
Winterhoff, Horst, 4,414,856., Cl. 73-862.360.

Lichtenstein, Joseph: *See*—
Gordon, Marvin; and Lichtenstein, Joseph, 4,415,288., Cl. 401-132.000.

Licinvest AG: *See*—
Ackeret, Peter, 4,415,079., Cl. 206-45.340.

Limberg, John F.: *See*—
Gumkowski, Bert A.; and Limberg, John F., 4,415,068., Cl. 188-72.300.

Lin, Horn-Bond: *See*—
Campillo, Anthony J.; and Lin, Horn-Bond, 4,415,265., Cl. 356-338.000.

Lin, Pin-Fang: *See*—
Ruddle, Frank H.; and Lin, Pin-Fang, 4,415,405., Cl. 156-645.000.

Lindberg, John E., to Owen, Wickersham & Erickson. Method and apparatus for heat storage in internal combustion engines. 4,414,932., Cl. 123-142.50R.

Linde Aktiengesellschaft: *See*—
Fuchs, Uwe, 4,415,454., Cl. 210-616.000.

Linde, Rolf: *See*—
Weiss, Hermann; Linde, Rolf; Mauser, Wilfried; and Klotz, Erhard, 4,416,019., Cl. 378-2.000.

Linnau, Yendra: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976., Cl. 128-334.00R.

Linyaev, Eugene J.: *See*—
Walkow, Arnold M.; and Linyaev, Eugene J., 4,415,030., Cl. 166-241.000.
Litton Industrial Products, Inc.: *See*—
Cutter, James W., 4,416,022., Cl. 378-206.000.
Stevenson, Christopher T. S., 4,415,172., Cl. 279-33.000.
Livingston, Lucy J. Garment hanger spacing apparatus. 4,415,093., Cl. 211-113.000.
Lo, Kwok S., to Wavetek. Sine wave to triangle wave convertor. 4,415,860., Cl. 328-22.000.
Loblich, Franz: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976., Cl. 128-334.00R.
Lockheed Corporation: *See*—
Hale, Thomas K.; and Kavaloski, Peter P., 4,415,177., Cl. 280-650.000.
Lockheed Missiles & Space Co., Inc.: *See*—
Buchanan, Robert A., 4,415,980., Cl. 378-58.000.
Loctite Corporation: *See*—
Nativi, Larry A., 4,415,604., Cl. 427-54.100.
Loepfe Brothers Limited: *See*—
Keller, Hans-Peter; and Bossard, Max, 4,415,008., Cl. 139-370.200.
Loigerot, Jean, to Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere. Chain saw for tree cutting pinion to be used in combination with the chain, and process for making the chain. 4,414,876., Cl. 83-830.000.
Long, Dennis M.: *See*—
Gonzales, Louis P.; and Long, Dennis M., 4,414,886., Cl. 99-495.000.
Long, George R., to Du Pont de Nemours, E. I., and Company. Cross identification system and lock. 4,415,802., Cl. 235-382.000.
Long, Thomas E.: *See*—
Engel, Robert F.; Long, Thomas E.; and Warrington, Ralph M., 4,415,293., Cl. 405-216.000.
Longuet, Andre, to Fives-Cail Babcock. Downflow evaporator. 4,415,407., Cl. 159-13.00A.
Lotte Co., Ltd.: *See*—
Takemori, Toshio; Kato, Masateru; and Masuda, Fumio, 4,415,595., Cl. 426-101.000.
Love, James H. Carbon dioxide snow horn for dry ice production. 4,415,346., Cl. 62-35.000.
Lowenfeld, Rudolf: *See*—
Buhler, Ulrich; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,415,494., Cl. 260-196.000.
Lowry, Philip L.: *See*—
Matheson, James N.; and Lowry, Philip L., 4,414,973., Cl. 128-206.150.
Loyd, Robert W. Conditioned compression ignition system for stratified charge engines. 4,414,940., Cl. 123-299.000.
Lubotskaya, Lidia N.: *See*—
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550., Cl. 424-57.000.
Lucas Industries Limited: *See*—
Pickering, John F.; and Evans, David, 4,415,070., Cl. 188-264.00F.
Luce, Dan G.: *See*—
Recane, Marion L.; Burns, William V.; McMillen, Charles E.; and Luce, Dan G., 4,415,951., Cl. 362-20.000.
Ludwig, Christian: *See*—
Rossmann, Dieter; Donn, Volker; and Ludwig, Christian, 4,415,250., Cl. 354-195.000.
Luebke, Robert W. Solar energy collecting panel and apparatus. 4,414,961., Cl. 126-432.000.
Luhleich, Hartmut; and Dias, Francisco J., to Kernforschungsanlage Julich GmbH. Silicon carbide body having pores filled with steel or steel alloys. 4,415,632., Cl. 428-408.000.
Lummus Company, The: *See*—
Bauer, William V., 4,415,357., Cl. 75-29.000.
Suciu, George D.; and Paustian, John E., 4,415,460., Cl. 210-754.000.
Lund, Anders E.: *See*—
Krueger, Gordon P.; and Lund, Anders E., 4,415,516., Cl. 264-112.000.
Lundin, Claes O. A.; and Simonsson, Berit I., to KenoGard AB. Process for the polymerization of ethylenically unsaturated monomers. 4,415,716., Cl. 526-209.000.
Lundsgaard, Finn C.; and Andersen, Willy, to Radiometer A/S. Apparatus for analyzing biological liquids. 4,415,534., Cl. 422-58.000.
Lundstrom, Malkolm S.: *See*—
Leirnes, Johan S.; and Lundstrom, Malkolm S., 4,415,360., Cl. 75-65.00R.
Luste, Anita Y.: *See*—
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550., Cl. 424-57.000.
Lutz, Bruno: *See*—
Hauser, Ivo J.; and Lutz, Bruno, 4,415,084., Cl. 206-461.000.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,414,896., Cl. 101-211.000.
Kraus, Josef; and Wech, Erich, 4,414,900., Cl. 101-363.000.
M.L. Aviation Company Limited: *See*—
Sellwood, Raymund E., 4,414,901., Cl. 102-206.000.
M & W Gear Company: *See*—
Fackler, Charles K., 4,415,041., Cl. 172-551.000.
MacAvoy, David W.: *See*—
Punako, Stephen; and MacAvoy, David W., 4,415,213., Cl. 339-49.00R.
MacDermott, Bruce R.: *See*—
Shapiro, Justin J.; and MacDermott, Bruce R., 4,415,101., Cl. 222-288.000.
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, to Eisai Co., Ltd. 7α-Methoxycephalosporin derivatives, and antibacterial drugs containing the same. 4,415,567., Cl. 424-246.000.
Mack, Mark P., to Conoco Inc. Catalyst and method for preparation of drag reducing substances. 4,415,714., Cl. 526-125.000.
Madan, Arun, to Chevron Research Company. Amorphous silicon solar cells incorporating an insulating layer in the body of amorphous silicon and a method of suppressing the back diffusion of holes into an N-type region. 4,415,760., Cl. 136-258.000.
Maeda, Koji; and Goda, Tadahiro, to Mitsubishi Denki Kabushiki Kaisha. Digital data processing system with asynchronous sensing units. 4,415,968., Cl. 364-178.000.
Maeda, Masaru: *See*—
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739., Cl. 548-367.000.
Maestrami, Marino, to Saipem S.p.A. Flanging system for suspending casting and tubing columns for high pressure oil or gas wells. 4,415,186., Cl. 285-142.000.
Maglic, Rastko C., to Motorola, Inc. Gauge pressure sensor. 4,414,851., Cl. 73-706.000.
Mahood, Douglas S. Footwear article with adjustable closure. 4,414,761., Cl. 36-50.000.
Maier, Roland: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,415,566., Cl. 424-246.000.
Maillat, Michel: *See*—
Niederhaeuser, Paul; Maillat, Michel; and Hintermann, Hans E., 4,415,419., Cl. 204-192.00C.
Mainwaring, David E.; and Jones, Charles U., to B. P. Australia Ltd.; and Broken Hill Proprietary Company Ltd., The. Coal preparation. 4,415,335., Cl. 44-1.00C.
Maiocco, Guiseppe A., to Champion Spark Plug Italiana S.p.A. Locking device for motor vehicles. 4,414,830., Cl. 70-252.000.
Mair, Christian; Van den Boom, Johannes; and Hollerweger, Heinz, to Boge GmbH; and Audi NSU Auto Union AG. Resilient mountings for machines or machine components, particularly engines in motor vehicles. 4,415,148., Cl. 267-122.000.
Major, Frederick A. Camera lens cover and sunshade apparatus. 4,415,242., Cl. 350-581.000.
Makowski, Henry S., deceased: *See*—
Klein, Robert R.; and Makowski, Henry S., deceased, 4,415,709., Cl. 525-344.000.
Makowski, Patricia H., executrix: *See*—
Klein, Robert R.; and Makowski, Henry S., deceased, 4,415,709., Cl. 525-344.000.
Maliarik, Mary J.: *See*—
Rohrbach, Ronald P.; and Maliarik, Mary J., 4,415,656., Cl. 435-96.000.
Malinge, Jean L.; Soster, Marie C.; and Lamarche, Dominique, to Socapex. Device and method for preparing multi-fiber optical cables for butt-jointing. 4,415,347., Cl. 65-4.210.
Mallinckrodt, Inc.: *See*—
Caskey, Douglas C.; and Chapman, Douglas W., 4,415,753., Cl. 564-418.000.
Manassen, Joost; and Dror, Yaakov, to Yeda Research and Development Company Ltd. Catalyst comprising a complex of an elongated organic moiety and a metal ion. 4,415,500., Cl. 260-429.00R.
Manner, Reinhard: *See*—
Voigt, Carl; Kleinschmit, Peter; and Manner, Reinhard, 4,415,485., Cl. 502-100.000.
Mansel, Jean E.; Masson, Charlie M. P.; Bertaux, Paul; and Grosmaitre, Andre M. J., to PCUK Produits Chimiques Ugine Kuhlmann. Process for treating residual waters containing aromatic amines. 4,415,461., Cl. 210-757.000.
Manville Service Corporation: *See*—
Timms, Donny L., 4,415,517., Cl. 264-118.000.
Marathon Electric: *See*—
Dewan, Shashi B., 4,415,846., Cl. 318-732.000.
Marcotte, Bernadine A. Apparatus for use in cutting hair. 4,414,991., Cl. 132-45.00R.
Marentic, Michael J., to Interstate Electronics Corporation. Advanced waveform techniques for plasma display panels. 4,415,892., Cl. 340-767.000.
Margraf, Adolf. Sealing systems for filter bags. 4,415,343., Cl. 55-379.000.
Marine Construction & Design Co.: *See*—
Deering, Kenneth J., 4,415,140., Cl. 254-371.000.
Marinelli, Joseph A. Axle and air bag suspension. 4,415,179., Cl. 280-713.000.
Mark Eyelet & Stamping, Inc.: *See*—
DePillo, Lawrence V., 4,415,212., Cl. 339-17.00C.
Mark, Victor, to General Electric Company. Aromatic polycarbonate compositions containing a C_{16}–C_{36}alkane compound as a mold release agent. 4,415,696., Cl. 524-490.000.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Branched aromatic polycarbonate from aliphatic polyol. 4,415,722., Cl. 528-196.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Branched aromatic polycarbonate from tetraphenol. 4,415,724., Cl. 528-204.000.

Mark, Victor: *See*—
Hedges, Charles V.; and Mark, Victor, 4,415,723., Cl. 528-204.000.
Hedges, Charles V.; and Mark, Victor, 4,415,725., Cl. 528-204.000.

Markley, Gerald E.; and Winter, William E., to Exxon Research and Engineering Co. Catalytic reforming process. 4,415,441., Cl. 208-138.000.

Marouby, Daniel: *See*—
Menard, Christian; Marouby, Daniel; and Chollet, Alain, 4,414,804., Cl. 60-39.141.

Marquardt, Bruno: *See*—
Westerkamp, Jurgen; and Marquardt, Bruno, 4,414,898., Cl. 101-248.000.

Marsh Stencil Machine Company: *See*—
Hill, Forrest G., 4,414,899., Cl. 101-331.000.

Marsy, Jean-Marie: *See*—
Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753., Cl. 33-356.000.

Martens, Jurgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, to Degussa Aktiengesellschaft. Process for the production thiazolines-(3). 4,415,738., Cl. 548-147.000.

Martin, Claude, to Mead Corporation, The. Multi-unit package. 4,415,082., Cl. 206-431.000.

Martin, Harley D. Method and apparatus for storing, dispensing and tying fish hooks. 4,414,771., Cl. 43-4.000.

Martin, Henry, to Ciba-Geigy Corporation. Furanyl oximes. 4,415,743., Cl. 549-491.000.

Martin, John D.: *See*—
Copeland, Robert J.; and Martin, John D., 4,415,759., Cl. 136-246.000.

Martin, Jose V., to Du Pont de Nemours, E. I., and Company. Automatic toning apparatus having a vertically reciprocating hopper. 4,414,916., Cl. 118-612.000.

Martin, Margaret L., to Western Electric Company, Inc. Methods of establishing a switching connection within a switching system. 4,415,773., Cl. 179-18.0AD.

Martin, Roger: *See*—
Brown, Michael H.; and Martin, Roger, 4,414,849., Cl. 73-290.00V.

Martinez, Jose. System for the generation of electrical energy by utilizing and controlling wind energy. 4,415,814., Cl. 290-55.000.

Martinez, Louis. Public alert and advisory systems. 4,415,771., Cl. 179-5.00R.

Martini, Leonard J., to United States of America, Navy. Integral elastomeric/graphite dynamic face seal. 4,415,165., Cl. 277-27.000.

Maruya, Takashi: *See*—
Naito, Hiroyuki; Maruya, Takashi; and Sugawara, Masaaki, 4,415,364., Cl. 106-74.000.

Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Pump for supplying kerosene to combustion apparatus. 4,415,308., Cl. 415-72.000.

Maruyama, Teruo; Yamauchi, Shinya; Yamamura, Shiro; and Morikawa, Yoshiyuki, to Matsushita Electric Industrial Co., Ltd. Sliding vane type rotary compressor. 4,415,320., Cl. 418-150.000.

Maruyama, Youji: *See*—
Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262., Cl. 355-125.000.

Masacchia, John. Break away wall structure. 4,414,777., Cl. 49-141.000.

Massachusetts Institute of Technology: *See*—
Kassakian, John G., 4,415,962., Cl. 363-131.000.

Masson, Charlie M. P.: *See*—
Mansel, Jean E.; Masson, Charlie M. P.; Bertaux, Paul; and Grosmaitre, Andre M. J., 4,415,461., Cl. 210-757.000.

Masters, Richard M. Greenhouse structure. 4,414,784., Cl. 52-73.000.

Masuda, Fumio: *See*—
Takemori, Toshio; Kato, Masateru; and Masuda, Fumio, 4,415,595., Cl. 426-101.000.

Masuda, Naosuke; Ohe, Takeshi; and Fujii, Tadaaki, to Jidosha Kiki Co., Ltd. Pump unit. 4,415,319., Cl. 418-135.000.

Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, to Unitika Ltd.; and Tsuyoshi Masumoto. Mn-Based alloy of nonequilibrium austenite phase. 4,415,529., Cl. 420-434.000.

Mateja, Edward J.: *See*—
Thornbery, James M.; Obermann, George; and Mateja, Edward J., 4,415,784., Cl. 200-35.00R.

Material Control, Inc.: *See*—
Wagner, James C.; Barnard, James E.; and Woerner, Robert J., 4,416,020., Cl. 378-181.000.

Matheny, Frances V.: *See*—
Matheny, Paul; and Matheny, Frances V., 4,415,159., Cl. 273-187.00A.

Matheny, Paul; and Matheny, Frances V. Golf stance viewer. 4,415,159., Cl. 273-187.00A.

Mathes, Egon, to U.S. Philips Corporation. Dynamic MOS-logic in interlace-techniques. 4,415,819., Cl. 307-481.000.

Matheson, James N.; and Lowry, Philip L., to U.S.D. Corp. Respirator face mask. 4,414,973., Cl. 128-206.150.

Mathews, Nicholas A. Bow sight. 4,414,751., Cl. 33-265.000.

Matsubara, Akitoshi: *See*—
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644., Cl. 430-106.600.

Matsui, Isamu; and Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Splicing apparatus for spun yarns. 4,414,798., Cl. 57-22.000.

Matsukawa, Hiroharu: *See*—
Nakamura, Sukenori; Igarashi, Akira; and Matsukawa, Hiroharu, 4,415,633., Cl. 428-411.000.

Matsumoto, Akio; Inazumi, Koichi; and Araki, Kazuhiro, to Matsushita Electric Works, Ltd. Step motor. 4,415,274., Cl. 368-160.000.

Matsumoto, Hiromitsu; and Sugiyama, Keiichi, to Yamaha Hatsudoki Kabushiki Kaisha. Internal combustion engine with exhaust gas recycling system. 4,414,953., Cl. 123-571.000.

Matsumoto, Jun: *See*—
Oguino, Masanori; Fujishima, Tooru; and Matsumoto, Jun, 4,416,002., Cl. 369-44.000.

Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Three stage graft polymerization process for preparing nitrile based resins. 4,415,708., Cl. 525-316.000.

Matsunaga, Isao: *See*—
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.

Matsuno, Takashi: *See*—
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958., Cl. 126-450.000.
Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, 4,415,308., Cl. 415-72.000.
Maruyama, Teruo; Yamauchi, Shinya; Yamamura, Shiro; and Morikawa, Yoshiyuki, 4,415,320., Cl. 418-150.000.
Nobue, Tomotaka; and Kusunoki, Shigeru, 4,415,789., Cl. 219-10.55B.
Schmidt, Hans; and Wolff, Robert A., 4,415,930., Cl. 358-191.100.
Tanaka, Junzo; Kai, Toshio; and Fujitani, Yoshitomo, 4,415,799., Cl. 219-400.000.

Matsushita Electric Works, Ltd.: *See*—
Matsumoto, Akio; Inazumi, Koichi; and Araki, Kazuhiro, 4,415,274., Cl. 368-160.000.

Matsushita Electronics Corporation: *See*—
Konosu, Osamu, 4,415,831., Cl. 313-413.000.

Matsuura, Kazuo: *See*—
Miyoshi, Mituji; Matsuura, Kazuo; and Tajima, Yoshio, 4,415,718., Cl. 526-348.600.

Matsuya, Yasuyuki: *See*—
Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, 4,415,882., Cl. 340-347.0AD.

Matthews, James B.; and DeLuzio, Reno A., to Raytheon Company. Phase-locked loop laser gyroscope system. 4,415,266., Cl. 356-350.000.

Mattuschka, Werner: *See*—
Kreutzev, Hans; and Mattuschka, Werner, 4,415,826., Cl. 310-354.000.

Matyas, Richard S.; and Hamshar, John A., to Cities Service Company. Integrated oxygasification and hydropyrolysis process for producing liquid and gaseous hydrocarbons. 4,415,431., Cl. 208-8.00R.

Mauldin, Donald M.; and Jones, Richard E., III. Brace for tibial fractures. 4,414,965., Cl. 128-87.00R.

Mauldin, Donald M.: *See*—
Morgan, R. Dean; Mauldin, Donald M.; and Taylor, Thomas L., 4,414,759., Cl. 36-11.500.

Mauleon, Jean L.: *See*—
Dean, Robert R.; Letzsch, Warren S.; and Mauleon, Jean L., 4,415,438., Cl. 208-120.000.

Mauser, Wilfried: *See*—
Weiss, Hermann; Linde, Rolf; Mauser, Wilfried; and Klotz, Erhard, 4,416,019., Cl. 378-2.000.

Max, Erhard: *See*—
Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, 4,415,634., Cl. 428-579.000.

May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., to Georgia Tech Research Institute. Use of aminoalkyl phenyl sulfide derivatives for the treatment of hypertension. 4,415,591., Cl. 424-330.000.

Maynard, Julian D.; and Williams, Earl G., to United States of America, Navy. Nonwavelength-limited holographic sound field reconstruction. 4,415,996., Cl. 367-8.000.

McBride, Daniel T.: *See*—
Dusenbury, Joseph H.; and McBride, Daniel T., 4,415,331., Cl. 8-114.600.

McCall, Charles F.; and Seelye, William P. Low ground clearance trailer. 4,415,181., Cl. 280-700.000.

McClung, Eugene F., Jr. Non-slidable bottom surface layer for a floor covering. 4,415,618., Cl. 428-88.000.

McCrary, Jack L.: *See*—
Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., 4,415,463., Cl. 252-8.55R.

McCullough, Harold E., to Bell Telephone Laboratories, Incorporated. Optical fiber switch apparatus. 4,415,229., Cl. 350-96.200.

McDaniel, George H.; and Hartford, Thomas W., to Bendix Corporation, The. Driving circuit for cathode ray tube. 4,415,985., Cl. 364-900.000.

McDonnell Douglas Corporation: *See*—
Lederich, Richard J.; and Sastry, Shankar M., 4,415,375., Cl. 148-11.50F.

McHarrie, John C.; Hopcroft, Peter W.; and Case, Donald B. Stapling devices. 4,415,111., Cl. 227-19.000.

McKay, Dwight L.: *See*—
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., 4,415,440., Cl. 208-120.000.

McKenzie, Robert W., to Rockwell International Corporation. Spring loaded diode contact apparatus. 4,415,218., Cl. 339-147.00R.

McKinney, Joe R.; and Swagger, Roy G., to Dana Corporation. Case hardening method for steel parts. 4,415,378., Cl. 148-12.100.

McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., to Wirtz Manufacturing Company, Inc. Machine for continuously casting battery grids. 4,415,016., Cl. 164-429.000.

McLean, James O., to General Electric Company. Coffeemaker with coffee spreader. 4,414,884., Cl. 99-304.000.

McMahan, David R., to General Motors Corporation. Retainer member for a vehicle headlamp. 4,415,956., Cl. 362-269.000.

McMillan, John E.: *See*—
Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., 4,415,830., Cl. 313-331.000.

McMillen, Charles E.: *See*—
Recane, Marion L.; Burns, William V.; McMillen, Charles E.; and Luce, Dan G., 4,415,951., Cl. 362-20.000.

McNamee, Michael: *See*—
Robinson, Graham; Ansell, Raymond O.; and McNamee, Michael, 4,415,637., Cl. 429-218.000.

McNeill, Thomas J., to Gould Inc. Automatic zero balance circuit. 4,414,852., Cl. 73-765.000.

McNesky, Guy P.; and Rice, E. Dale, to General Molding, Inc. Wall mounted light weight automatic water distiller. 4,415,075., Cl. 202-177.000.

McWhorter, Thomas E., to Air Products and Chemicals, Inc. Cryogenic freezer. 4,414,823., Cl. 62-266.000.

Mead Corporation, The: *See*—
Martin, Claude, 4,415,082., Cl. 206-431.000.

Mechanical Products, Inc.: *See*—
Kirkup, Joseph F.; and Horning, Randall A., 4,415,875., Cl. 337-62.000.

Medford, Richard D.; and Cooper, Jerry W., to Dayco Corporation. Method of making a hose construction. 4,415,389., Cl. 156-91.000.

Medlin, William L.; Strubhar, Malcolm K.; and Fitch, John L., to Mobil Oil Corporation. Method for fracturing a plurality of subterranean formations. 4,415,035., Cl. 166-308.000.

Medney, Jonas. Method for making strengthened porous pipe and resulting product. 4,415,613., Cl. 428-36.000.

Medtronic, Inc.: *See*—
Dickhudt, Eugene A.; and Paulson, Roger A., 4,414,986., Cl. 128-785.000.

Meier, Albert, to Zschokke Wartmann AG. Stator casing for air-cooled electrical machines. 4,415,824., Cl. 310-89.000.

Meighan, Richard M.; and Cash, Harry R., Jr., to Allied Corporation. Lead-acid storage battery. 4,415,638., Cl. 429-225.000.

Meins, Wolfgang. Drinking aid for containers of beverages and other liquids. 4,415,097., Cl. 220-90.400.

Melin, Ake L., to SAB Nife AB. Method of recovering nickel from a spent fat hardening catalyst. 4,415,541., Cl. 423-140.000.

Mellin, Robert C., to General Motors Corporation. Engine cooling fan with shearable drive to eliminate fan overspeed. 4,414,925., Cl. 123-41.120.

Menard, Christian; Marouby, Daniel; and Chollet, Alain, to Automobiles Peugeot; and Automobiles Citroen. Apparatus for ignition and reignition for a gas turbine. 4,414,804., Cl. 60-39.141.

Mendenhall, Charles E.; and Buckert, Michael D., to Priam. Digital motor speed controller. 4,415,844., Cl. 318-254.000.

Menjo, Atsuhiko; and Saitoh, Shinji, to Tokyo Shibaura Denki Kabushiki Kaisha. Production of Schottky barrier diode. 4,414,737., Cl. 29-578.000.

Mensik, Alphonse J. Manhole service vehicle. 4,415,066., Cl. 187-9.00R.

Merck & Co., Inc.: *See*—
Bolhofer, William A.; and Prugh, John D., 4,415,575., Cl. 424-251.000.
Durette, Philippe L., 4,415,731., Cl. 536-18.400.
Grabner, Roy; and Paul, Edward L., 4,415,670., Cl. 435-285.000.
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvratt, Matthew J., Jr., 4,415,496., Cl. 260-239.30B.
Hernandez, Sebastian, 4,415,669., Cl. 435-253.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Eidenschink, Rudolf; and Pohl, Ludwig, 4,415,470., Cl. 252-299.630.

Merritt, Henry B.: *See*—
Utsch, Francis V.; de la Burde, Roger Z.; Aument, Patrick E.; and Merritt, Henry B., 4,414,987., Cl. 131-296.000.

Messe, Gerard; and Faure, Michel, to Societe Anonyme dite: Alsthom-Atlantique. Electric shunt inductance winding for an electricity power transport line. 4,415,874., Cl. 336-178.000.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
Kaczensky, Friedrich; Kroy, Walter; and Reithmeier, Gunter, 4,415,231., Cl. 350-269.000.
Voigt, Werner, 4,415,298., Cl. 410-69.000.

Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Brunsch, Klaus; and Schindler, Rudolf, 4,414,860., Cl. 74-579.00E.

Messersmith, David: *See*—
Herchen, Stephen R.; and Messersmith, David, 4,415,737., Cl. 548-146.000.

Messrs. Adidas Sportschuhfabriken Adi Dassker KG: *See*—
Bente, Alfred, 4,414,763., Cl. 36-134.000.

Metco Properties: *See*—
Garrett, David L., 4,415,526., Cl. 376-409.000.

Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, to Arbed S.A. Method of desulfurizing a ferrous melt. 4,415,358., Cl. 75-58.000.

Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, to Bayer Aktiengesellschaft. Antibiotic compound, its production and its medicinal use. 4,415,557., Cl. 424-172.000.

Meyer, Leonard S., to Victor United, Inc. Portable tree climbing device. 4,415,061., Cl. 182-92.000.

Meyer, Raymond J., to Deere & Company. Hinged hatch roof assembly for a vehicle cab. 4,415,197., Cl. 296-216.000.

Meyers, John J., to Eastman Kodak Company. Passive cooling of mirrors. 4,415,234., Cl. 350-310.000.

Michigan Technological University, Board of Control of: *See*—
Krueger, Gordon P.; and Lund, Anders E., 4,415,516., Cl. 264-112.000.

Michoff, John C. Strong and weak signal preamplification system. 4,416,023., Cl. 455-291.000.

Micro Dent Industries, Inc.: *See*—
Puro, Nicholas S., 4,414,868., Cl. 81-416.000.

Mid-West Conveyor Company, Inc.: *See*—
Burt, Harold S., 4,415,975., Cl. 364-444.000.

Mikulski, Barry S.: *See*—
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.

Mikumo, Masatoshi: *See*—
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,415,703., Cl. 525-54.210.

Mileos, George: *See*—
Kostanecki, Andrew T.; and Mileos, George, 4,414,714., Cl. 24-265.0WS.

Miles Laboratories, Inc.: *See*—
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666., Cl. 435-179.000.
Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,415,592., Cl. 424-331.000.

Miller, Donald E.; and Werstak, Charles E., to SCM Corporation. Spray dried coffee whiteners with reduced milk protein. 4,415,600., Cl. 426-613.000.

Miller, Donald N.: *See*—
Hasenauer, Charles R.; and Miller, Donald N., 4,415,626., Cl. 428-323.000.

Miller, Loren K.: *See*—
Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., 4,414,843., Cl. 73-66.000.

Miller, Theodore E., Jr.: *See*—
Small, Hamish; and Miller, Theodore E., Jr., 4,414,842., Cl. 73-61.10C.

Milliken Research Corporation: *See*—
Dusenbury, Joseph H.; and McBride, Daniel T., 4,415,331., Cl. 8-114.600.
Weitzel, Edward W., 4,414,696., Cl. 5-475.000.

Mima, Hiroshi: *See*—
Matsui, Isamu; and Mima, Hiroshi, 4,414,798., Cl. 57-22.000.

Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, to Adeka Argus Chemical Co., Ltd. Poly(piperidylamine) alkanes and synthetic resin compositions stabilized thereby. 4,415,688., Cl. 524-102.000.

Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, to Adeka Argus Chemical Co., Ltd. Synthetic resin compositions containing 2,2,6,6-tetramethyl piperidinyl triazines. 4,415,689., Cl. 524-103.000.

Minamida, Kohji: *See*—
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739., Cl. 548-367.000.

Mine Equipment Company: *See*—
Taylor, Jerry F., 4,415,051., Cl. 180-65.00R.

Mingace, Herbert S., Jr.: *See*—
Benton, Stephen A.; Houde-Walter, William R.; and Mingace, Herbert S., Jr., 4,415,225., Cl. 350-3.840.

Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., to Celanese Corporation. Process for achieving higher orientation in partially oriented yarns. 4,415,521., Cl. 264-176.00F.

Ministry of International Trade and Industry: *See*—
Sakamoto, Koji, 4,415,989., Cl. 365-19.000.

Minnesota Mining and Manufacturing Company: *See*—
Dressler, Daryl D.; and Fiala, Jimmy L., 4,415,894., Cl. 340-825.570.
Esmay, Donald L.; Johnson, Gordon G.; and Vesley, George F., 4,415,615., Cl. 428-40.000.
Foss, George D., 4,415,342., Cl. 55-96.000.
Roiko, Russell A.; and Pokorny, Richard J., 4,415,694., Cl. 524-200.000.
Shapiro, Jules S., 4,414,967., Cl. 128-92.00B.

Minolta Camera Kabushiki Kaisha: *See*—
Karasaki, Toshihiko; Gotoh, Takayuki; Namba, Yasuhiro; and Yamakawa, Eiji, 4,415,246., Cl. 354-25.000.

Mishra, Amarendra; Speros, Dimitri M.; and Eastin, Roger M., to General Electric Company. Electron emissive coatings for electric discharge devices. 4,415,835., Cl. 313-627.000.

Mista, Kresimir; and Englert, Norbert, to Karl Mayer Textilmaschinfabrik, GmbH. Summation drive for controlling shogging in a warp knitting machine. 4,414,826., Cl. 66-207.000.
Mita Industrial Company Limited: *See*—
Kouchi, Toshihiro; and Aizawa, Tatsuo, 4,415,645., Cl. 430-107.000.
Mitarai, Tsuyoshi; and Yamaguchi, Takeshi, to Casio Computer Co., Ltd. Tone data compressing and expanding system for digital electronic musical instrument. 4,414,878., Cl. 84-1.190.
Mitchell, Donald F.: *See*—
Young, David M.; Mitchell, Donald F.; and Amey, Edward, 4,414,972., Cl. 128-200.230.
Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., to International Business Machines Corporation. Electrolytic printing process with wear resistant electrode. 4,415,905., Cl. 346-1.100.
Mitchell, Ronald W. Harness and attachment method. 4,414,790., Cl. 54-2.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Iwasa, Tatsuya; Inoue, Takayuki; and Mizuta, Noriyuki, 4,415,765., Cl. 174-72.00A.
Maeda, Koji; and Goda, Tadahiro, 4,415,968., Cl. 364-178.000.
Morishita, Mitsuharu, 4,415,848., Cl. 322-32.000.
Yamada, Shigeo; Takawashi, Tamio; and Sakakibara, Toshimitsu, 4,415,791., Cl. 219-69.00G.
Yamanaka, Takashi, 4,415,787., Cl. 200-144.00B.
Mitsubishi Paper Mills, Ltd.: *See*—
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,415,627., Cl. 428-332.000.
Mitsubishi Petrochemical Co. Ltd.: *See*—
Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, 4,415,476., Cl. 502-224.000.
Mitsubishi Rayon Company, Ltd.: *See*—
Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, 4,415,509., Cl. 264-1.300.
Mitsui, Hiroki: *See*—
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.
Mitsui, Tetsuro: *See*—
Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, 4,415,178., Cl. 280-664.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Takizawa, Kinji, 4,414,746., Cl. 33-125.00C.
Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, to Fujitsu Limited. Measurement method and system utilizing ultrasonic wave. 4,414,850., Cl. 73-599.000.
Miyajima, Mikio: *See*—
Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, 4,414,893., Cl. 101-93.150.
Miyamoto, Katsuhito: *See*—
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.
Miyao, Fumio: *See*—
Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, 4,415,933., Cl. 358-281.000.
Miyasako, Yoji; Sugimoto, Takashi; and Tanaka, Toru, to Tokyo Shibaura Denki Kabushiki Kaisha. Color signal processing circuit of color television receiver. 4,415,919., Cl. 358-26.000.
Miyashita, Kiyoshi: *See*—
Kasuga, Muneo; Miyashita, Kiyoshi; and Nishikawa, Masaji, 4,415,260., Cl. 355-14.0SH.
Miyashita, Tsutomu: *See*—
Komenou, Kazunari; Miyashita, Tsutomu; and Ohashi, Makoto, 4,415,988., Cl. 365-16.000.
Miyata, Shigeo: *See*—
Anabuki, Hitoshi; and Miyata, Shigeo, 4,415,555., Cl. 424-147.000.
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, to Mitsubishi Paper Mills, Ltd. Chemically resistant thermosensitive recording paper. 4,415,627., Cl. 428-332.000.
Miyoshi, Masakazu: *See*—
Kodama, Yutaka; and Miyoshi, Masakazu, 4,415,192., Cl. 292-347.000.
Miyoshi, Mituji; Matsuura, Kazuo; and Tajima, Yoshio, to Nippon Oil Company, Ltd. Terpolymer produced from ethylene, propylene and butylene-1. 4,415,718., Cl. 526-348.600.
Miyoshi, Takeomi: *See*—
Hatsushi, Suehiro; Mitsui, Tetsuro; and Miyoshi, Takeomi, 4,415,178., Cl. 280-664.000.
Mizoguchi, Toshimi: *See*—
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497., Cl. 260-245.20T.
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamota, Takahito, to NGK Spark Plug Co., Ltd. Sparkplug with antifouling coating on discharge end of insulator. 4,415,828., Cl. 313-118.000.
Mizusawa Industrial Chemicals Ltd.: *See*—
Naito, Hiroyuki; Maruya, Takashi; and Sugawara, Masaaki, 4,415,364., Cl. 106-74.000.
Mizuta, Noriyuki: *See*—
Iwasa, Tatsuya; Inoue, Takayuki; and Mizuta, Noriyuki, 4,415,765., Cl. 174-72.00A.
Mobil Oil Corporation: *See*—
Angevine, Philip J., 4,415,436., Cl. 208-89.000.
Chen, Albert C.; and Nagy, Frank A., 4,415,468., Cl. 252-182.000.
Clayton, William J.; and Outhouse, William G., 4,415,087., Cl. 206-632.000.
Hunt, William C., III, 4,415,031., Cl. 166-261.000.
Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,415,544., Cl. 423-328.000.
Medlin, William L.; Strubhar, Malcolm K.; and Fitch, John L., 4,415,035., Cl. 166-308.000.
Moeckel, George P.; and Wallick, George C., 4,415,999., Cl. 367-73.000.
Shu, Winston R., 4,415,032., Cl. 166-273.000.
Wilson, Jack L., 4,415,997., Cl. 367-15.000.
Mobil Solar Energy Corporation: *See*—
Wald, Fritz; and Kalejs, Juris P., 4,415,401., Cl. 156-608.000.
Mochizuki, Manabu: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; and Tatsumi, Susumu, 4,415,533., Cl. 422-4.000.
Modular Automation, Inc.: *See*—
Leinenger, John T., 4,415,074., Cl. 193-37.000.
Moeckel, George P.; and Wallick, George C., to Mobil Oil Corporation. Method of confirming seismic data interpretation. 4,415,999., Cl. 367-73.000.
Mogens Rued Nielsen ApS: *See*—
Bavnsfelt, Hans, 4,415,094., Cl. 215-252.000.
Molins Machine Company, Inc.: *See*—
Craemer, Robert H.; and Woolston, A. Brent, 4,415,978., Cl. 364-475.000.
Momma, Naohiro: *See*—
Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, 4,415,385., Cl. 148-189.000.
Money, David K.: *See*—
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979., Cl. 128-419.00F.
Mongeon, Ronald W., to Stellar Systems, Inc. Intrusion detector. 4,415,885., Cl. 340-552.000.
Monkowski, Joseph R.; and Tressler, Richard E. Solid film growth via preferential etching of liquid solutions. 4,415,545., Cl. 423-348.000.
Monsanto Company: *See*—
Ebner, Jerry R., 4,415,482., Cl. 502-205.000.
Schumacher, Ignatius; and Wang, Kang-Bo, 4,415,744., Cl. 560-20.000.
Montefiore Hospital: *See*—
Stanko, Ronald T., 4,415,576., Cl. 424-252.000.
Montierth, Max R.: *See*—
Frost, Rodney I.; and Montierth, Max R., 4,415,344., Cl. 55-523.000.
Moon, Edward T.: *See*—
Johnstone, Theodore R.; and Kaatz, James P., 4,414,795., Cl. 56-328.0TS.
Moore, Curtis L.: *See*—
Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., 4,415,629., Cl. 428-375.000.
Moragrega, Miguel S. Impact filter for tipped cigarettes. 4,414,989., Cl. 131-339.000.
Moraw, Roland: *See*—
Dryczynski, Kurt; Schadlich, Gunther; and Moraw, Roland, 4,415,947., Cl. 361-235.000.
Morgan, Annis R., Jr.: *See*—
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 4,414,768., Cl. 40-584.000.
Morgan, Edward L.: *See*—
Weigle, William O.; and Morgan, Edward L., 4,415,493., Cl. 260-112.50R.
Morgan, John H.: *See*—
Brodie, Don E.; and Morgan, John H., 4,415,602., Cl. 427-39.000.
Morgan, R. Dean; Mauldin, Donald M.; and Taylor, Thomas L. Orthopedic shoe. 4,414,759., Cl. 36-11.500.
Morgan, Thomas K., Jr.: *See*—
Diamond, Julius; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,415,587., Cl. 424-273.00R.
Mori, Hiromitsu, to Casio Computer Co., Ltd. Compact electronic device having calendar function. 4,415,271., Cl. 368-41.000.
Mori, Toshihito: *See*—
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497., Cl. 260-245.20T.
Moriguchi, Haruhiko: *See*—
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,415,904., Cl. 346-1.100.
Morikawa, Yoshiyuki: *See*—
Maruyama, Teruo; Yamauchi, Shinya; Yamamura, Shiro; and Morikawa, Yoshiyuki, 4,415,320., Cl. 418-150.000.
Morishita, Mitsuharu, to Mitsubishi Denki Kabushiki Kaisha. Alternating current power source apparatus for car. 4,415,848., Cl. 322-32.000.
Morishita, Sadao: *See*—
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,415,627., Cl. 428-332.000.
Morita, Yutaka: *See*—
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka, 4,416,006., Cl. 369-240.000.
Morris, George E., to General Electric Company. Electrical circuit and method of controlling such. 4,414,820., Cl. 62-226.000.
Morrison-Knudsen Forest Products, Inc.: *See*—
Henckel, David J.; and Peters, Thomas E., 4,415,324., Cl. 425-83.100.
Mosbach, Klaus H.; and Nilsson, Kurt G. I., to Pharmacia Fine Chemicals AB. Method of covalently binding biologically active organic substances to polymeric substances. 4,415,665., Cl. 435-179.000.

Mosier, Benjamin; McCrary, Jack L.; and Guilbeau, Karl G., to Dow Chemical Co., The. Preparation of viscosifiers for zinc salt workover and completion brines. 4,415,463., Cl. 252-8.55R.
Moss, James W.: *See—*
Floyd, James N., 4,415,284., Cl. 400-134.000.
Motorola, Inc.: *See—*
Adlhoch, Richard H., 4,415,992., Cl. 365-94.000.
James, Kristi L., 4,415,115., Cl. 228-170.000.
Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,416,017., Cl. 375-99.000.
Kuhl, Virgil F.; and White, Gary J., 4,415,219., Cl. 339-195.00M.
Maglic, Rastko C., 4,414,851., Cl. 73-706.000.
Sievers, Kirk A.; and Santis, Dean C., 4,415,849., Cl. 322-99.000.
Mott, Godfrey T., to National Research Development Corporation. Blood flow monitor apparatus. 4,414,980., Cl. 128-664.000.
Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, to Crouzet. Process for compensating the magnetic disturbances in the determination of a magnetic heading, and devices for carrying out this process. 4,414,753., Cl. 33-356.000.
Moutonnier, Claude: *See—*
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,562., Cl. 424-246.000.
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,735., Cl. 544-22.000.
Mowe, Wayne T.: *See—*
Blackmon, Lawrence E.; Dees, John R.; and Mowe, Wayne T., 4,414,801., Cl. 57-288.000.
Moyers, Thomas L. Safety device for animal trap. 4,414,773., Cl. 43-97.000.
MTS Systems Corporation: *See—*
Haeg, Steven R., 4,414,854., Cl. 73-847.000.
Mueller, Patricia W.: *See—*
May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., 4,415,591., Cl. 424-330.000.
Mueller, Ruediger, to Siemens Aktiengesellschaft. Monolithically integrated circuit for the production of long pulses. 4,415,816., Cl. 307-265.000.
Mueschke, Herman W. Ambidextrous safety for guns. 4,414,769., Cl. 42-70.00R.
Mugrauer, Hubert: *See—*
Kopp, Walter; Mugrauer, Hubert; and Stuerzer, Anton, 4,415,257., Cl. 355-3.0TR.
Mulvanny, Patrick; and Bartky, Scott, to Nicolet Instrument Corporation. Automatic calibration system for video displays in vision testing. 4,415,921., Cl. 358-139.000.
Munger, Stanley H.; Short, Michael R.; and Swatton, David W., to Du Pont de Nemours, E. I., and Company. Flexographic printing plates containing blended adhesives. 4,415,649., Cl. 430-271.000.
Munro, Bradley L.: *See—*
Scoggins, Lacey E.; and Munro, Bradley L., 4,415,729., Cl. 528-388.000.
Muoi, Tran V., to Bell Telephone Laboratories, Incorporated. Optical receiver with improved dynamic range. 4,415,803., Cl. 250-214.00A.
Murahashi, Takashi: *See—*
Yukawa, Koji; Murahashi, Takashi; and Sakurai, Isao, 4,415,261., Cl. 355-75.000.
Murakami, Keiichi: *See—*
Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,414,850., Cl. 73-599.000.
Murata Corporation of America: *See—*
Blickstein, Martin J., 4,415,949., Cl. 361-296.000.
Murata, Hideki: *See—*
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644., Cl. 430-106.600.
Murata Kikai Kabushiki Kaisha: *See—*
Matsui, Isamu; and Mima, Hiroshi, 4,414,798., Cl. 57-22.000.
Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, to Fuji Xerox Co., Ltd. Carrier wave recovery circuit. 4,415,933., Cl. 358-281.000.
Murialdo, Gastonge: *See—*
Peter, Fritz; and Murialdo, Gastonge, 4,414,758., Cl. 34-233.000.
Murphy, Martin A., to Exxon Research and Engineering Co. Distillation process. 4,415,443., Cl. 208-355.000.
Murphy, Thomas V. Modular merchandise display tower. 4,415,077., Cl. 206-44.00R.
Murray Corporation: *See—*
Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., 4,414,715., Cl. 24-283.000.
Murrell, Lawrence L.; and Grenoble, Dane C., to Exxon Research and Engineering Co. Transition metal oxide Bronsted acid catalysts. 4,415,480., Cl. 502-242.000.
Murrell, Lawrence L.: *See—*
Grenoble, Dane C.; and Murrell, Lawrence L., 4,415,437., Cl. 208-120.000.
Muth, David L.: *See—*
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,415,832., Cl. 313-533.000.
Mutsaers, Cornelis A. H. A.: *See—*
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., 4,415,486., Cl. 252-514.000.
Muzhzhavlev, Konstantin D.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Myer, Jon H., to Hughes Aircraft Company. Ophthalmic clip. 4,414,985., Cl. 128-782.000.
N. V. Weefautomaten Picanol: *See—*
Shaw, Henry A., 4,415,009., Cl. 139-435.000.
Nachtigall, Guenter W.: *See—*
Grudzinskas, Charles V.; and Nachtigall, Guenter W., 4,415,501., Cl. 260-429.300.
Nadelson, Jeffrey: *See—*
Brand, Leonard J.; and Nadelson, Jeffrey, 4,415,568., Cl. 424-248.400.
Naem, Abdalla A. H.; Calder, Iain D.; and Naguib, Hussein M., to Northern Telecom Limited. Method of fabricating semiconductor devices using laser annealing. 4,415,383., Cl. 148-187.000.
Nagase, Masaomi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the air intake of an internal combustion engine. 4,414,943., Cl. 123-339.000.
Nagata, Saburo; and Nara, Ken, to Canon Kabushiki Kaisha. Tactile sensibility testing equipment. 4,415,326., Cl. 434-113.000.
Nagel, Gerhard; and Dasting, Klaus, to Eaelte Pendatflex Corporation. Means for accommodating an ink roller. 4,414,864., Cl. 81-3.00R.
Naguib, Hussein M.: *See—*
Naem, Abdalla A. H.; Calder, Iain D.; and Naguib, Hussein M., 4,415,383., Cl. 148-187.000.
Nagy, Frank A.: *See—*
Chen, Albert C.; and Nagy, Frank A., 4,415,468., Cl. 252-182.000.
Naito, Hiroyuki; Maruya, Takashi; and Sugawara, Masaaki, to Mizusawa Industrial Chemicals Ltd. One-package inorganic binder composition. 4,415,364., Cl. 106-74.000.
Nakada, Hiroyasu, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Port scavenging type two-cycle internal combustion engine. 4,414,928., Cl. 123-73.0PP.
Nakagawa, Kazuyuki: *See—*
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572., Cl. 424-250.000.
Nakahara, Hidetoshi: *See—*
Kai, Tomokazu; and Nakahara, Hidetoshi, 4,415,770., Cl. 179-2.0EB.
Nakahara, Kichio: *See—*
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamota, Takahito, 4,415,828., Cl. 313-118.000.
Nakahara, Yutaka: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,415,688., Cl. 524-102.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,415,689., Cl. 524-103.000.
Nakajima, Toshio: *See—*
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739., Cl. 548-367.000.
Nakajima, Yoshihiro: *See—*
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,415,965., Cl. 364-136.000.
Nakamura, Hisashi, to Diesel Kiki Co., Ltd. Fuel injection system for multi-cylinder internal combustion engines, having high injection pressure. 4,414,947., Cl. 123-446.000.
Nakamura, Sukenori; Igarashi, Akira; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,415,633., Cl. 428-411.000.
Nakanishi, Tatsuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for fuel injection in electronic fuel injection controlled engines. 4,414,941., Cl. 123-326.000.
Nakashima, Kunimichi: *See—*
Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, 4,414,732., Cl. 29-568.000.
Nakatsui, Hisashi: *See—*
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920., Cl. 358-37.000.
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, to Kowa Co., Ltd. Process for producing an antibiotic. 4,415,497., Cl. 260-245.20T.
Nakayama, Takashi; Yamagata, Seiichi; and Kajita, Koji, to Toray Industries, Inc. Twisted yarn and method of producing the same. 4,414,800., Cl. 57-236.000.
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, to Nitto Boseki Co., Ltd. Traverse motion for use with apparatus for winding continuous elongate elements. 4,415,126., Cl. 242-43.00R.
Nalco Chemical Company: *See—*
Osborne, James A., 4,415,446., Cl. 210-101.000.
Namba, Yasuhiro: *See—*
Karasaki, Toshihiko; Gotoh, Takayuki; Namba, Yasuhiro; and Yamakawa, Eiji, 4,415,246., Cl. 354-25.000.
Nara, Ken: *See—*
Nagata, Saburo; and Nara, Ken, 4,415,326., Cl. 434-113.000.
Narasaka, Shin: *See—*
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,414,950., Cl. 123-479.000.
Narasimhan, Mandayam J., Jr.: *See—*
Thirumalachar, Mandayam J.; and Narasimhan, Mandayam J., Jr., 4,415,661., Cl. 435-174.000.
Thirumalachar, Mandayam J.; and Narasimhan, Mandayam J., Jr., 4,415,662., Cl. 435-176.000.

Narozny, Ronald S., to Thomas & Betts Corporation. Connector for mass-ground termination of multiconductor cable. 4,415,216., Cl. 339-107.000.

Nasu, Hitoo: *See—*
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050., Cl. 180-6.480.

Nathanson, Rex: *See—*
Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, 4,415,772., Cl. 369-60.000.

National Can Corporation: *See—*
Cholmar, Sidney, 4,415,394., Cl. 156-379.800.

National Distillers and Chemical Corporation: *See—*
Hinnenkamp, James A., 4,415,473., Cl. 252-373.000.
Kwiatek, Jack; and Brima, Thomas S., 4,415,475., Cl. 502-206.000.

National Research Development Corporation: *See—*
Capaccio, Giancarlo; Smith, Francis S.; and Ward, Ian M., 4,415,522., Cl. 264-210.800.
Mott, Godfrey T., 4,414,980., Cl. 128-664.000.

National Semiconductor Corporation: *See—*
Gross, William H., 4,415,868., Cl. 330-294.000.

National Steel Corporation: *See—*
Saunders, William T., 4,414,836., Cl. 72-349.000.

Nativi, Larry A., to Loctite Corporation. Conformal coating and potting system. 4,415,604., Cl. 427-54.100.

Naumann, Klaus: *See—*
Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, 4,415,561., Cl. 424-219.000.

NCR Corporation: *See—*
Cynkar, Thomas E.; and House, James G., 4,415,606., Cl. 427-90.000.
Italiano, Victor J.; and Sayko, Steven P., 4,415,909., Cl. 346-140.00R.
Reece, John W., 4,415,910., Cl. 346-140.00R.

Necchi, S.p.A.: *See—*
Bar, Alfredo, 4,415,060., Cl. 181-272.000.

Negi, Shigeto: *See—*
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567., Cl. 424-246.000.

Nelb, Robert G., II: *See—*
Chen, Augustin T.; Nelb, Robert G., II; and Onder, Kemal, 4,415,693., Cl. 524-198.000.

Nelson, Alfred M.: *See—*
Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906., Cl. 346-74.500.

Nelson, David: *See—*
Breitweiser, Steve; and Nelson, David, 4,414,725., Cl. 29-156.40R.

Nelson, Erik B., to Dow Chemical Company, The. Pumpable thixotropic cement slurries for use in cementing pipes in a well. 4,415,367., Cl. 106-89.000.

Nelson Holland, Henry A.; and Bandura, James, to Raymond International Builders, Inc. Distributor head for a pipe lining machine. 4,414,918., Cl. 118-306.000.

Nelson Research & Development Company: *See—*
Rajadhyaksha, Vithal J., 4,415,563., Cl. 424-244.000.

Nemoto, Reishi: *See—*
Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, 4,414,908., Cl. 112-169.000.

Nestle Company, Inc., The: *See—*
Hauser, Ivo J.; and Lutz, Bruno, 4,415,084., Cl. 206-461.000.

Neufeld, Henry L., to Brunswick Corporation. Thumb stop retention and anti-rattle spring. 4,415,129., Cl. 242-84.20A.

Neumann, Manfred, to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Compagnie. Castor locking device for arresting the rotation and the swivelling of the castor. 4,414,702., Cl. 16-35.00R.

Newman, Fred C., to Continental Group, Inc., The. Method of forming an annular seam between two container body halves. 4,415,387., Cl. 156-69.000.

News Log International, Inc.: *See—*
Ackerman, Richard C.; Jewer, Alan A.; and Hurlbut, Donovan W., 4,416,001., Cl. 369-44.000.

NGK Spark Plug Co., Ltd.: *See—*
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamota, Takahito, 4,415,828., Cl. 313-118.000.
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, 4,415,877., Cl. 338-34.000.

Nicholas, Michel: *See—*
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004., Cl. 137-884.000.

Nicksic, Stephen W., to Chevron Research Company. Method for modifying electron spin resonance signals from hydrocarbon crude. 4,415,671., Cl. 436-29.000.

Nicolas, Jacques; and Lenglet, Paul, to Societe Anonyme dite: Stein Industrie. Method and apparatus for bending a long metal member. 4,414,833., Cl. 72-13.000.

Nicolet Instrument Corporation: *See—*
Mulvanny, Patrick; and Bartky, Scott, 4,415,921., Cl. 358-139.000.

Niederhaeuser, Paul; Maillat, Michel; and Hintermann, Hans E., to Laboratoire Suisse de Recherches Horlogeres. Process for producing a corrosion-resistant solid lubricant coating. 4,415,419., Cl. 204-192.00C.

Nieh, Edward C. Y., to Texaco Inc. Polymeric cationic substituted acrylamide surfactants. 4,415,717., Cl. 526-287.000.

Nield, Eric; and Thompson, Martin K., to Imperial Chemical Industries PLC. Extruded profiles. 4,415,699., Cl. 524-538.000.

Nielsen, Anker J., Jr.; and Hoyt, Richard E., to Nissan Motor Co., Ltd. Locking device for an electric meter box. 4,414,829., Cl. 70-160.000.

Nijman, Aloysius J.; and Schoofs, Franciscus A. C. M., to U.S. Philips Corporation. Arrangement for exchanging signals between separated circuits. 4,415,775., Cl. 179-78.00R.

Nijman, John P., to Allied Corporation. Insulation-pierce and crimp termination tool. 4,414,740., Cl. 29-751.000.

Nilsson, Kurt G. I.: *See—*
Mosbach, Klaus H.; and Nilsson, Kurt G. I., 4,415,665., Cl. 435-179.000.

Nilsson, Ove: *See—*
Johansson, Arne; Larsson, Torsten; and Nilsson, Ove, 4,414,764., Cl. 37-141.00T.

Nintendo Co., Ltd.: *See—*
Yokoi, Gunpei, 4,415,153., Cl. 273-1.0GC.

Nippon Electric Co., Ltd.: *See—*
Chiba, Hiroshi; and Ogura, Shoichi, 4,415,917., Cl. 357-70.000.
Kai, Tomokazu; and Nakahara, Hidetoshi, 4,415,770., Cl. 179-2.0EB.

Nippon Kokan Kabushiki Kaisha: *See—*
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381., Cl. 148-153.000.

Nippon Oil Company, Ltd.: *See—*
Miyoshi, Mituji; Matsuura, Kazuo; and Tajima, Yoshio, 4,415,718., Cl. 526-348.600.

Nippon Shinyaku Co. Ltd.: *See—*
Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570., Cl. 424-249.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,415,508., Cl. 261-114.00R.

Nippon Soken, Inc.: *See—*
Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, 4,414,847., Cl. 73-204.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,414,840., Cl. 73-35.000.
Yasuda, Eturo; Asano, Mitsuru; and Ohta, Minoru, 4,415,876., Cl. 338-34.000.

Nippon Steel Corporation: *See—*
Nishimura, Mitsuhiko; and Sakurada, Morikatsu, 4,415,359., Cl. 75-60.000.

Nippon Telegraph & Telephone Corp.: *See—*
Ogawa, Katsuhiko; and Horiguchi, Shinju, 4,415,818., Cl. 307-465.000.

Nippon Telegraph & Telephone Public Corporation: *See—*
Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, 4,415,882., Cl. 340-347.0AD.

Nippon Zeon Co., Ltd.: *See—*
Joh, Yasushi, 4,415,490., Cl. 525-54.200.

Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, to Kubota, Ltd. Drive pump arrangement for working vehicle. 4,415,050., Cl. 180-6.480.

Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying apparatus with transfer bias voltage stabilizer. 4,415,254., Cl. 355-3.0TR.

Nishikawa, Masaji: *See—*
Kasuga, Muneo; Miyashita, Kiyoshi; and Nishikawa, Masaji, 4,415,260., Cl. 355-14.0SH.

Nishikawa, Mineki, to Tokyo Shibaura Denki Kabushiki Kaisha. Scintillation camera. 4,415,982., Cl. 364-527.000.

Nishikawa, Tetsuji: *See—*
Haga, Takahiro; Nishikawa, Tetsuji; Nakajima, Toshio; Minamida, Kohji; and Maeda, Masaru, 4,415,739., Cl. 548-367.000.

Nishimatsu, Masaharu: *See—*
Kubota, Yuichi; Nishimatsu, Masaharu; and Tanaka, Kazushi, 4,415,630., Cl. 428-403.000.

Nishimura, Mitsuhiko; and Sakurada, Morikatsu, to Nippon Steel Corporation. Multi-step steelmaking refining method. 4,415,359., Cl. 75-60.000.

Nishioka, Kimihiko; and Yamashita, Nobuo, to Olympus Optical Co., Ltd. Illumination optical system for an endoscope. 4,415,240., Cl. 350-442.000.

Nishizawa, Jun-ichi; and Konishi, Masahiro, to Fuji Photo Film Co. Ltd. Solid-state image storage device. 4,415,937., Cl. 358-335.000.

Nissan Motor Company: *See—*
Hayashi, Yoshimasa, 4,415,059., Cl. 181-250.000.

Nissan Motor Co., Ltd.: *See—*
Endo, Takuya, 4,415,118., Cl. 237-12.30A.
Kodama, Yutaka; and Miyoshi, Masakazu, 4,415,192., Cl. 292-347.000.
Nielsen, Anker J., Jr.; and Hoyt, Richard E., 4,414,829., Cl. 70-160.000.
Suzuki, Kunihiko, 4,415,058., Cl. 180-247.000.
Takada, Toshiaki; and Hiraiwa, Kazuyoshi, 4,415,786., Cl. 200-61.910.

Nitto Boseki Co., Ltd.: *See—*
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126., Cl. 242-43.00R.

Nizova, Svetlana A.: *See—*
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477., Cl. 502-178.000.

Noba, Masahiko: *See—*
Ueda, Masahiro; and Noba, Masahiko, 4,414,937., Cl. 123-198.00D.

Nobue, Tomotaka; and Kusunoki, Shigeru, to Matsushita Electric Industrial Co. Ltd. Microwave oven having controllable frequency microwave power source. 4,415,789., Cl. 219-10.55B.
Nochumson, Samuel; and Witt, Henry J., to FMC Corporation. Support for electrophoresis and method of producing same. 4,415,428., Cl. 204-299.00R.
Noda, Masaru, to Hitachi, Ltd. Signal processing circuit. 4,415,923., Cl. 358-41.000.
Nojiri, Naohiro: *See*—
Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, 4,415,476., Cl. 502-224.000.
Nomoto, Seiichiro: *See*—
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567., Cl. 424-246.000.
Nomura, Akira: *See*—
Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570., Cl. 424-249.000.
Nomura, Ichiro: *See*—
Goto, Koji; Kajita, Isamu; Nomura, Ichiro; and Kawashima, Hirokuni, 4,415,643., Cl. 430-94.000.
Nordstrom, John D.: *See*—
Peng, Stephen C.; and Nordstrom, John D., 4,415,697., Cl. 524-512.000.
Northern Telecom Limited: *See*—
Agnew, David G., 4,415,777., Cl. 179-170.0NC.
Garner, John N.; Roberge, Jean M.; and Baxter, Douglas G., 4,414,802., Cl. 57-293.000.
Naem, Abdalla A. H.; Calder, Iain D.; and Naguib, Hussein M., 4,415,383., Cl. 148-187.000.
Norton, W. Jack, to PPG Industries, Inc. Soldering tool with resilient hold-down attachment and method of using same. 4,415,116., Cl. 228-180.00A.
Novak, Robert F., to Ford Motor Company. Partial pressure of oxygen sensor-III. 4,415,878., Cl. 338-34.000.
NSK-Warner K. K.: *See*—
Shoji, Masao; and Kinoshita, Yoshio, 4,415,072., Cl. 192-45.000.
Nuovo Pignone S.p.A.: *See*—
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,415,185., Cl. 285-114.000.
N.V. Tot Keuring van Elektrotechnische Materialen: *See*—
Beuse, Robert H. J.; van Iterson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., 4,415,279., Cl. 374-204.000.
Nypro Inc.: *See*—
Paradis, Joseph R.; and Kaleskas, Edward W., 4,415,003., Cl. 137-843.000.
Obayashi, Hideki: *See*—
Kohama, Tokio; Kawai, Hisasi; Obayashi, Hideki; and Egami, Tsuneyuki, 4,414,847., Cl. 73-204.000.
Oberhardt, Bruce J.: *See*—
D'Orazio, Paul A.; Eddy, Arthur R., Jr.; Fogt, Eric J.; Jones, James E.; and Oberhardt, Bruce J., 4,415,666., Cl. 435-179.000.
Obermann, George: *See*—
Thornbery, James M.; Obermann, George; and Mateja, Edward J., 4,415,784., Cl. 200-35.00R.
OBO Bettermann OHG: *See*—
Jordan, Ernst G., 4,415,792., Cl. 219-98.000.
Obst, Martha L., administrator: *See*—
Obst, Rudiger, deceased, 4,415,214., Cl. 339-91.00R.
Obst, Rudiger, deceased (by Obst, Martha L., administrator), to C. A. Weidmuller GmbH & Co. Postfach. Electrical plug and socket connectors. 4,415,214., Cl. 339-91.00R.
Occhini, Elio: *See*—
Priaroggia, Paolo G.; and Occhini, Elio, 4,415,761., Cl. 174-25.00R.
Occidental Chemical Corporation: *See*—
Kosanovich, George M.; and Salee, Gideon, 4,415,721., Cl. 528-176.000.
Occidental Research Corporation: *See*—
Veber, Andre, 4,415,413., Cl. 204-98.000.
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, to Chugai Seiyaku Kabushiki Kaisha. Novel uracil derivatives, process for preparing the same and a pharmaceutical composition containing the same. 4,415,573., Cl. 424-251.000.
Odell, Jeffrey A.: *See*—
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,415,523., Cl. 264-342.00R.
Odmann, Gert O., to Gotaverken Motor U.S. Inc. T-Joint fitting. 4,415,000., Cl. 137-318.000.
Oellig, Franklin A.: *See*—
Campbell, Willis R.; and Oellig, Franklin A., 4,414,888., Cl. 100-88.000.
Oetken, James E.; and Buschmann, Jeffrey P., to GTE Products Corporation. Tungsten halogen lamp with coiled getter. 4,415,833., Cl. 313-559.000.
Ogawa, Hidenori: *See*—
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572., Cl. 424-250.000.
Ogawa, Katsuhiko; and Horiguchi, Shinju, to Nippon Telegraph & Telephone Corp. Programmable sequential logic circuit devices. 4,415,818., Cl. 307-465.000.
Ogawa, Yukifumi: *See*—
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381., Cl. 148-153.000.
Ogawa, Yukio: *See*—
Hirohata, Michio; and Ogawa, Yukio, 4,415,252., Cl. 354-234.000.
Oguino, Masanori; Fujishima, Tooru; and Matsumoto, Jun, to Hitachi, Ltd. Method and apparatus for high-density recording and reproduction. 4,416,002., Cl. 369-44.000.
Ogura, Masahiro: *See*—
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657., Cl. 435-106.000.
Ogura, Shoichi: *See*—
Chiba, Hiroshi; and Ogura, Shoichi, 4,415,917., Cl. 357-70.000.
Ogurtsov, Vladimir V.: *See*—
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.
Ohashi, Makoto: *See*—
Komenou, Kazunari; Miyashita, Tsutomu; and Ohashi, Makoto, 4,415,988., Cl. 365-16.000.
Ohba, Yasuhiro: *See*—
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
Ohe, Takeshi: *See*—
Masuda, Naosuke; Ohe, Takeshi; and Fujii, Tadaaki, 4,415,319., Cl. 418-135.000.
Ohmi, Hidehiko, to Toyo Seikan Kaisha, Ltd. Container closure having an improved liner. 4,415,096., Cl. 215-343.000.
Ohminato, Kiyoshi, to King Jim Co., Ltd. Binder assembly of the ring type. 4,415,290., Cl. 402-26.000.
Ohmura, Hideo; and Horino, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for processing paper sheets of banded paper sheet bundles and a processing machine therefor. 4,414,730., Cl. 29-426.300.
Ohnishi, Kunio: *See*—
Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, 4,415,509., Cl. 264-1.300.
Ohno, Fumiaki: *See*—
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka, 4,416,006., Cl. 369-240.000.
Ohno, Masaji: *See*—
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657., Cl. 435-106.000.
Ohshima, Hiroo: *See*—
Maruyama, Teruo; Ohshima, Hiroo; Iwai, Fumio; and Abe, Yoshikazu, 4,415,308., Cl. 415-72.000.
Ohshima, Jiro: *See*—
Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372., Cl. 148-1.500.
Ohta, Minoru: *See*—
Yasuda, Eturo; Asano, Mitsuru; and Ohta, Minoru, 4,415,876., Cl. 338-34.000.
Oil & Sales Limited Partnership: *See*—
Benson, Terrence M., 4,414,808., Cl. 60-372.000.
Okamoto, Ichiro: *See*—
Toga, Yuzo; Shimada, Toshio; and Okamoto, Ichiro, 4,415,727., Cl. 528-272.000.
Okamura, Shigeru: *See*—
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, 4,415,886., Cl. 340-618.000.
Okazaki, Michio, to Diesel Kiki Co., Ltd. Vane compressor having a lightweight rotor. 4,415,321., Cl. 418-179.000.
Okita, Yoshishiro: *See*—
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050., Cl. 180-6.480.
Okumura, Fumio: *See*—
Miyauchi, Masahiro; Morishita, Sadao; Okumura, Fumio; and Higuchi, Masahiro, 4,415,627., Cl. 428-332.000.
Oliemuller, Casey. Speedometer cable lubrication tool. 4,415,064., Cl. 184-15.00R.
Olin Corporation: *See*—
Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832., Cl. 72-8.000.
Kadija, Igor V., 4,415,416., Cl. 204-147.000.
Pryor, Michael J.; and Brenneman, William L., 4,415,377., Cl. 148-12.00R.
Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,415,017., Cl. 164-453.000.
Oliver, Donald W.: *See*—
Fertl, Walter H.; and Oliver, Donald W., 4,415,805., Cl. 250-260.000.
Olofsson Corporation, The: *See*—
Garnett, Donald W., 4,414,724., Cl. 29-39.000.
Olsen, Gregory H., to RCA Corporation. Semiconductor light emitting device. 4,416,011., Cl. 372-45.000.
Olympus Optical Co., Ltd.: *See*—
Hattori, Shinichiro; and Inoue, Yasuo, 4,415,952., Cl. 362-32.000.
Kasuga, Muneo; Miyashita, Kiyoshi; and Nishikawa, Masaji, 4,415,260., Cl. 355-14.0SH.
Nishikawa, Masaji, 4,415,254., Cl. 355-3.0TR.
Nishioka, Kimihiko; and Yamashita, Nobuo, 4,415,240., Cl. 350-442.000.
Omata, Hiroshi: *See*—
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785., Cl. 200-38.00B.

Onder, Kemal: *See*—
Chen, Augustin T.; Nelb, Robert G., II; and Onder, Kemal, 4,415,693., Cl. 524-198.000.
Ono, Katsuhiro; and Sakimura, Shigeki, to Idemitsu Kosan Company Limited. Rubberized asphalt composition and process for producing same. 4,415,702., Cl. 524-705.000.
Ono, Kenichi: *See*—
Ikehata, Yukio; and Ono, Kenichi, 4,415,276., Cl. 368-187.000.
Ono, Tsuyoshi: *See*—
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka, 4,416,006., Cl. 369-240.000.
Onoe, Hideo: *See*—
Kitamura, Masatsugu; Onoe, Hideo; Ohno, Fumiaki; Ono, Tsuyoshi; Kishima, Yukihiro; and Morita, Yutaka, 4,416,006., Cl. 369-240.000.
Ootsuka, Yoshinori: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,414,840., Cl. 73-35.000.
Optimetrix Corporation: *See*—
Johannsmeier, Karl-Heinz, 4,414,749., Cl. 33-180.00R.
Orii, Takeshi, to Kabushiki Kaisha Orii Jidoki Seisakusho. Press secondary machining line control device. 4,414,887., Cl. 100-45.000.
Osborne, James A., to Nalco Chemical Company. Automatic chemical solution mixing unit. 4,415,446., Cl. 210-101.000.
Oscar Mayer & Co., Inc.: *See*—
Koken, Ernest E., 4,414,707., Cl. 17-1.00F.
Osei-Gyimah, Peter; Cartier, Peter G.; and Ellis, Paul E., to Rohm and Haas Company. Reverse osmosis membranes based on hydroxyalkyl methacrylate and methacrylic acid copolymers. 4,415,455., Cl. 210-654.000.
Osrow, Harold; and Shulman, Elliott, to Osrow Products Corporation. Pasta-making kitchen appliance with a drying arrangement. 4,415,323., Cl. 425-72.00S.
Osrow Products Corporation: *See*—
Osrow, Harold; and Shulman, Elliott, 4,415,323., Cl. 425-72.00S.
Ostermayer, Frederick W., Jr.: *See*—
Burton, Randolph H.; Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,415,414., Cl. 204-129.300.
Ostrowsky, Efrem M., to Ethyl Products Company. Overcenter hinge. 4,414,705., Cl. 16-225.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Fail safe device for air/fuel ratio feedback control system. 4,414,950., Cl. 123-479.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572., Cl. 424-250.000.
Ottaviano, Gary W., to Ranpak Corp. Cushioning dunnage apparatus. 4,415,398., Cl. 156-470.000.
Oudet, Claude, to Portescap. Electric motor control device. 4,415,845., Cl. 318-696.000.
Outhouse, William G.: *See*—
Clayton, William J.; and Outhouse, William G., 4,415,087., Cl. 206-632.000.
Ovcharenko, Vladimir G.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Overbeek, Robert B.: *See*—
Campbell, Chris A.; and Overbeek, Robert B., 4,415,073., Cl. 192-54.000.
Overly, Incorporated: *See*—
Whipple, Rodger E., 4,414,757., Cl. 34-155.000.
Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodowsky, Stanley, Jr., to Black & Decker Inc. Turbine sander. 4,414,781., Cl. 51-170.0MT.
Owen, Wickersham & Erickson: *See*—
Lindberg, John E., 4,414,932., Cl. 123-142.50R.
Owens-Illinois, Inc.: *See*—
Engstrom, John H.; and Ellis, Robert W., 4,415,349., Cl. 65-137.000.
Oy Alko AB: *See*—
Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapolku, Pertti J., 4,415,659., Cl. 435-161.000.
Pabel, Hans: *See*—
Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124., Cl. 241-28.000.
Pacher, Lothar: *See*—
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273., Cl. 368-74.000.
Paik, Stephen R.: *See*—
Schweigert, Lothar L.; and Paik, Stephen R., 4,415,095., Cl. 215-329.000.
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A. Treatment-and-prophylactic tooth paste possessing anticarious effect. 4,415,550., Cl. 424-57.000.
Pako Corporation: *See*—
Euteneuer, Charles L., 4,415,282., Cl. 400-30.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Company. Herbicide compositions. 4,415,352., Cl. 71-88.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Company. Herbicide compositions. 4,415,353., Cl. 71-100.000.
Palmieri, Beniamino. Apparatus for intraoperative diagnosis. 4,415,107., Cl. 225-93.500.
Palmquist, Steven R.; and Gaiser, Ronald D., to Tektronix, Inc. Programmable pulse generator. 4,415,861., Cl. 328-58.000.
Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., to Electric Power Research Institute, Inc. Insulated conductor. 4,415,629., Cl. 428-375.000.
Papenfahs, Theodor: *See*—
Volk, Heinrich; and Papenfahs, Theodor, 4,415,750., Cl. 562-467.000.
Paque, Michael W., to Kroy Inc. Apparatus for applying a printing or cutting force to a laminated tape. 4,415,395., Cl. 156-384.000.
Paradis, Joseph R.; and Kaleskas, Edward W., to Nypro Inc. Control of fluid flow using a flexible disc. 4,415,003., Cl. 137-843.000.
Pardes, Greg: *See*—
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,415,121., Cl. 239-229.000.
Paris, Rafael R., to Grow Group, Inc. Apparatus for maintaining free movement of a mixing object in a pressurized container. 4,415,099., Cl. 222-94.000.
Parker, Glenn T.: *See*—
Smith, Jon D.; and Parker, Glenn T., 4,415,299., Cl. 411-340.000.
Parry, John F. W., to R & D Associates. Hot air solar engine. 4,414,812., Cl. 60-641.140.
Pasieka, Donald F.: *See*—
Gauler, Allen L.; and Pasieka, Donald F., 4,414,748., Cl. 33-174.00Q.
Patchett, Arthur A.: *See*—
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvratt, Matthew J., Jr., 4,415,496., Cl. 260-239.30B.
Pathfinder Systems, Inc.: *See*—
Fasse, Mark E.; and Glesmann, Herbert C., 4,414,903., Cl. 104-244.100.
Pattarozzi, Domenico, to B.S.P. Packaging Systems Di Pattarozzi D. & C. S.A.S. Apparatus for transforming blanks into corresponding containers by parallelepiped shape. 4,414,789., Cl. 53-566.000.
Paul, Edward L.: *See*—
Grabner, Roy; and Paul, Edward L., 4,415,670., Cl. 435-285.000.
Paul, Volker: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586., Cl. 424-273.00R.
Paulson, Roger A.: *See*—
Dickhudt, Eugene A.; and Paulson, Roger A., 4,414,986., Cl. 128-785.000.
Paustian, John E.: *See*—
Suciu, George D.; and Paustian, John E., 4,415,460., Cl. 210-754.000.
Payne, David W. Closure clip for snack food bags and the like. 4,414,717., Cl. 24-30.50R.
Payne, Rex E., Jr., to Dawn Designs, Inc. Stroller latch. 4,415,180., Cl. 280-650.000.
PCUK Produits Chimiques Ugine Kuhlmann: *See*—
Mansel, Jean E.; Masson, Charlie M. P.; Bertaux, Paul; and Grosmaitre, Andre M. J , 4,415,461., Cl. 210-757.000.
Pearce, Henry A., Jr.: *See*—
Palumbo, Anthony J.; Pearce, Henry A., Jr.; and Moore, Curtis L., 4,415,629., Cl. 428-375.000.
Pearson, H. C., to Portland Iron Works. Gang saw apparatus. 4,414,875., Cl. 83-508.300.
Peng, Stephen C.; and Nordstrom, John D., to Ford Motor Company. Paint composition comprising hydroxy functional film former and crosslinked dispersion flow control additive. 4,415,697., Cl. 524-512.000.
Penney, Bruce J., to Tektronix, Inc. Calibration reference signal generator. 4,415,927., Cl. 358-139.000.
Pensenstadler, David F.: *See*—
Peterson, Steven H.; and Pensenstadler, David F., 4,414,858., Cl. 73-863.330.
Peppmoller, Reinmar, to Chemische Fabrik Stockhausen GmbH. Mixture of alkali salts of sulfo-succinic acid dialkylesters and higher aliphatic alcohols, use thereof to defoam mineral acid decomposition media. 4,415,472., Cl. 252-321.000.
Pere, Gerard, to Creusot-Loire. Device for supply and discharge of liquid electrolyte for an electrolyzer of filterpress type. 4,415,424., Cl. 204-257.000.
Periot, Jean-Marie, to La Telemecanique Electrique. Detector apparatus of the two-terminal type supplied with rectified A.C. power the voltage of which can vary in a wide range, with load control by switching thyristors. 4,415,945., Cl. 361-100.000.
Perkin-Elmer Corporation, The: *See*—
Gelernt, Barry; and Wang, C. Wallace, 4,415,402., Cl. 156-626.000.
Wittmer, Charles M., 4,415,264., Cl. 356-315.000.
Perkut, B. R. Key-operated lock. 4,414,831., Cl. 70-276.000.
Perregaux, Alain, to BBC Brown, Boveri & Company, Limited. Light diffusing reflector for electro-optical displays and process for producing thereof. 4,415,236., Cl. 350-338.000.

Peter, Fritz; and Murialdo, Gastonge. Conveyor for cooling and removal of objects from an in-line sectional production machine. 4,414,758., Cl. 34-233.000.

Peters, Horst: *See—*
Idel, Karsten; Buysch, Hans-Josef; Peters, Horst; and Buekers, Josef, 4,415,692., Cl. 524-183.000.

Peters, Thomas E.: *See—*
Henckel, David J.; and Peters, Thomas E., 4,415,324., Cl. 425-83.100.

Petersen, Christian C., to Polaroid Corporation. Camera shutter having bobbin driven blades. 4,415,251., Cl. 354-230.000.

Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., to Peterson Tool Company. Cutting tool. 4,414,870., Cl. 82-36.00R.

Peterson, Steven H.; and Pensenstadler, David F., to Westinghouse Electric Corp. Steam turbine fluid sampling apparatus. 4,414,858., Cl. 73-863.330.

Peterson Tool Company: *See—*
Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., 4,414,870., Cl. 82-36.00R.

Petrimaux, Eric: *See—*
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004., Cl. 137-884.000.

Pettis, Arthur C.: *See—*
Brady, Robert H.; Beaumont, Michael L.; and Pettis, Arthur C., 4,415,879., Cl. 340-27.0NA.

Petzold, Lothar: *See—*
Kreinberg, Manfred; and Petzold, Lothar, 4,414,765., Cl. 38-54.000.

Pew, Melvin E. Wheelchair elevating apparatus enabling a user to lift himself from the floor to a wheelchair seat. 4,415,202., Cl. 297-217.000.

Peyronel, Jean-Francois: *See—*
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,562., Cl. 424-246.000.
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,735., Cl. 544-22.000.

Pfeiffer, Hans C.: *See—*
Langner, Guenther O.; and Pfeiffer, Hans C., 4,415,851., Cl. 324-51.000.

Pfister, Joseph, to H. Berthold, AG. Apparatus for the transport of a light sensitive material in a phototypesetting machine. 4,415,109., Cl. 226-181.000.

Pfitzner, Jorg: *See—*
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557., Cl. 424-172.000.

Phares, Lindsey J., to Raymond International Builders, Inc. Offshore drilling of large diameter holes in rock formations. 4,415,045., Cl. 175-9.000.

Pharmacia Fine Chemicals AB: *See—*
Mosbach, Klaus H.; and Nilsson, Kurt G. I., 4,415,665., Cl. 435-179.000.

Phelps, Barry C.: *See—*
Hall, John S.; and Phelps, Barry C., 4,415,612., Cl. 428-29.000.

Philip Morris Incorporated: *See—*
Utsch, Francis V.; de la Burde, Roger Z.; Aument, Patrick E.; and Merritt, Henry B., 4,414,987., Cl. 131-296.000.

Phillips Petroleum Company: *See—*
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., 4,415,440., Cl. 208-120.000.
Scoggins, Lacey E.; and Munro, Bradley L., 4,415,729., Cl. 528-388.000.

Phillips, Robert S.: *See—*
May, Sheldon W.; Phillips, Robert S.; Herman, Heath H.; and Mueller, Patricia W., 4,415,591., Cl. 424-330.000.

Phillips, William H., to United States of America, National Aeronautics and Space Administration. Solar powered aircraft. 4,415,133., Cl. 244-53.00R.

Piacentini, Bruno: *See—*
Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, 4,415,304., Cl. 414-589.000.

Pickering, John F.; and Evans, David, to Lucas Industries Limited. Hose connector. 4,415,070., Cl. 188-264.00F.

Piepho, Ralf F., to Colloid Piepho. Agent for the purification of waste waters and process for its production. 4,415,467., Cl. 252-181.000.

Pikus, Francis W.: *See—*
Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., 4,415,830., Cl. 313-331.000.

Pillsbury Company, The: *See—*
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.

Pioch, Peter P.; and Schober, Annette, to Black & Decker Inc. Circular saw. 4,414,743., Cl. 30-124.000.

Pioneer Electronic Corporation: *See—*
Kunugi, Yoshiro, 4,415,862., Cl. 330-10.000.
Tokumo, Akio, 4,415,863., Cl. 330-10.000.

Pitts, Warren R., to Dennison Manufacturing Company. Antistatic chairmat. 4,415,946., Cl. 361-212.000.

Plachy, Ivo T., to Telex Computer Products, Inc. Method of manufacturing a composite foam tape transport capstan. 4,415,513., Cl. 264-45.400.

Playvnietse, Rita M.: *See—*
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550., Cl. 424-57.000.

Plevy, Arthur L.: *See—*
Bice, James W.; Gravel, Charles L.; and Bernstein, Harold, 4,414,837., Cl. 73-1.00B.

Plummer, Steven J.; and Wieloch, James E., to Siemens Corporation. X-Ray examination apparatus. 4,416,021., Cl. 378-181.000.

Pochurek, Gerald M.; and Keilly, Ronald J. Continuous curing of cable. 4,415,518., Cl. 264-166.000.

Podanenko, Alexandr T.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.

Podola, Nikolai V.; Kuchuk-Yatsenko, Sergei I.; Krivonos, Vadim P.; and Grabchev, Boris L., to AN USSR Institut Elektrosvarki imeni E.O. Patona. Welder for continuous resistance flash-butt welding. 4,415,793., Cl. 219-110.000.

Pohl, Ludwig: *See—*
Eidenschink, Rudolf; and Pohl, Ludwig, 4,415,470., Cl. 252-299.630.

Pohl, Rudolph L., to Hercules Incorporated. Post-exposure process. 4,415,654., Cl. 430-328.000.

Pohorski, Daniel W., to James Dole Corporation. Container sterilizer and discharge system. 4,415,539., Cl. 422-304.000.

Pokorny, Richard J.: *See—*
Roiko, Russell A.; and Pokorny, Richard J., 4,415,694., Cl. 524-200.000.

Polaroid Corporation: *See—*
Benton, Stephen A.; Houde-Walter, William R.; and Mingace, Herbert S., Jr., 4,415,225., Cl. 350-3.840.
Bilofsky, Ruth C.; and Sahatjian, Ronald A., 4,415,648., Cl. 430-220.000.
Choinski, Edward J., 4,415,610., Cl. 427-372.200.
Guerra, John M., 4,415,958., Cl. 362-301.000.
Herchen, Stephen R.; and Messersmith, David, 4,415,737., Cl. 548-146.000.
Petersen, Christian C., 4,415,251., Cl. 354-230.000.

Polidori, Mario. Electrical connector. 4,415,222., Cl. 339-270.00R.

Pollard, William T., to Westvaco Corporation. Container with self locking bottom. 4,415,117., Cl. 229-39.00R.

Ponder, Jonathan Z., to Electric Power Research Institute. Flexible gas-insulated electrical cable having non-metallic flexible inserts between central conductor and support insulators. 4,415,762., Cl. 174-28.000.

Porenski, Harry S., Jr.; and Kohnhorst, Earl E., to Brown & Williamson Tobacco Corporation. Method and apparatus for determining percent solids in a slurry. 4,414,841., Cl. 73-61.00R.

Porta Systems Comp.: *See—*
Hung, Peter C., 4,415,783., Cl. 200-11.00A.

Portescap: *See—*
Oudet, Claude, 4,415,845., Cl. 318-696.000.

Portland Iron Works: *See—*
Pearson, H. C., 4,414,875., Cl. 83-508.300.

Poshemansky, Vladimir M.: *See—*
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.

Potts, P. Keith, to Eastman Kodak Company. Automatic sliding gate valve. 4,415,139., Cl. 251-62.000.

Powell, Arthur: *See—*
Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodowsky, Stanley, Jr., 4,414,781., Cl. 51-170.0MT.

PPG Industries, Inc.: *See—*
Norton, W. Jack, 4,415,116., Cl. 228-180.00A.

Prabhu, Ashok N.; and Hang, Kenneth W., to RCA Corporation. Air-fireable thick film inks. 4,415,624., Cl. 428-209.000.

Pradhan, Roger R.: *See—*
Bramfitt, Bruce L.; Hansen, Steven S.; Harper, Donald L.; and Pradhan, Roger R., 4,415,376., Cl. 148-12.00F.

Prast, Gijsbert: *See—*
Braat, Josephus J. M.; Haisma, Jan; and Prast, Gijsbert, 4,415,238., Cl. 350-432.000.

Pratt, Donna K.; and Terrell, Jamie B., to Gearhart Industries, Inc. Downhole well tool and anchoring assembly. 4,415,029., Cl. 166-212.000.

President and Fellows of Harvard College: *See—*
Goldstein, Richard N., 4,415,660., Cl. 435-172.000.
Siegel, Don L., 4,415,668., Cl. 435-241.000.

Press Machinery Corporation of Illinois: *See—*
Schwartz, Michael A.; and Yamagata, Toshio, 4,414,895., Cl. 101-177.000.

Presset, Rene: *See—*
Moulin, Michel; Goudon, Jean-Claude; Marsy, Jean-Marie; Legendarme, Bernard; Presset, Rene; and Dedreuil-Monnet, Louis, 4,414,753., Cl. 33-356.000.

Pressley, Robert J., to Allied Corporation. Laser process for gettering defects in semiconductor devices. 4,415,373., Cl. 148-1.500.

Prete, Ernest, Jr., to Ancra Corporation. Quick-release strap buckle. 4,414,713., Cl. 24-193.000.

Preussag-Boliden-Blei GmbH: *See—*
Klotz, Peter; and Bottcher, Henry, 4,415,144., Cl. 266-228.000.

Priam: *See—*
Mendenhall, Charles E.; and Buckert, Michael D., 4,415,844., Cl. 318-254.000.

Priaroggia, Paolo G.; and Occhini, Elio, to Societa Cavi Pirelli Societa per Azioni. Taped electric cable. 4,415,761., Cl. 174-25.00R.

Priaroggia, Paolo G.; Bianchi, Giuseppe; and Sala, Angelo, to Societa' Cavi Pirelli S.p.A. Submarine electric cable with tubular stiffening means and method of applying the stiffening means. 4,415,764., Cl. 174-37.000.

Pribnow, Gary P., to Briggs & Stratton Corporation. Compression release mechanism using a bimetallic disc. 4,414,933., Cl. 123-182.000.

Printronix, Inc.: *See—*
Jennings, Alan K., 4,415,286., Cl. 400-279.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Strassel, Albert, 4,415,519., Cl. 264-171.000.

Prommel, Johan A.: *See—*
Van Hattem, Arie; Prommel, Johan A.; and Roes, Augustinus W. M., 4,415,445., Cl. 209-5.000.

Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Aqueous processable, positive-working photopolymer compositions. 4,415,651., Cl. 430-277.000.

Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Aqueous processable, positive-working photopolymer compositions. 4,415,652., Cl. 430-277.000.

Protic, Davor; and Riepe, Georg, to Kernforschungsanlage Julich GmbH. Germanium semiconducting radiation detector with phosphorus implanted n^+ contact. 4,415,916., Cl. 357-29.000.

Provincial Holdings Ltd.: *See—*
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,415,540., Cl. 423-99.000.

Prudhomme, Pierre: *See—*
Bouteille, Daniel; Nicholas, Michel; Petrimaux, Eric; and Prudhomme, Pierre, 4,415,004., Cl. 137-884.000.

Prugh, John D.: *See—*
Bolhofer, William A.; and Prugh, John D., 4,415,575., Cl. 424-251.000.

Pryor, Michael J.; and Brenneman, William L., to Olin Corporation. Duplex rolling process and apparatus. 4,415,377., Cl. 148-12.00R.

Pryor, Michael J.: *See—*
Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832., Cl. 72-8.000.

Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., to General Electric Company. Inlead construction for electric lamp. 4,415,830., Cl. 313-331.000.

Punako, Stephen; and MacAvoy, David W., to Bendix Corporation, The. Hermaphrodite electrical connector. 4,415,213., Cl. 339-49.00R.

Puro, Nicholas S., to Micro Dent Industries, Inc. Box joint for a plier-type tool with removable securing plate. 4,414,868., Cl. 81-416.000.

Puskas, Imre; and James, David E., to Standard Oil Company (Indiana). Palladium on carbon catalyst for purification of crude terephthalic acid. 4,415,479., Cl. 502-85.000.

Pyke, David R.; and Reid, Robert, to Imperial Chemical Industries PLC. Production of saturated carbonyl compounds. 4,415,757., Cl. 568-475.000.

Quack, Jochen M.: *See—*
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,487., Cl. 252-546.000.
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,488., Cl. 252-547.000.

Queneau, Paul B.; Doane, Robert E.; Berggren, Mark H.; and Cooperrider, Mark W., to Compagne Francaise D'Entreprises Minieres, Metallurgiques et D'Investissements. Controlling scale composition during acid pressure leaching of laterite and garnierite ore. 4,415,542., Cl. 423-141.000.

R & D Associates: *See—*
Parry, John F. W., 4,414,812., Cl. 60-641.140.

Rader, Edward F.: *See—*
Stasi, Michael A.; Bowman, Walker H.; and Rader, Edward F., 4,415,336., Cl. 44-13.000.

Rader, Robert R.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,415,016., Cl. 164-429.000.

Radiometer A/S: *See—*
Lundsgaard, Finn C.; and Andersen, Willy, 4,415,534., Cl. 422-58.000.

Raducanu, Dan C.: *See—*
Hoffman, Harald; Pacher, Lothar; Busch, Peter; and Raducanu, Dan C., 4,415,273., Cl. 368-74.000.

Rahse, Wilfried: *See—*
Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124., Cl. 241-28.000.

Rajadhyaksha, Vithal J., to Nelson Research & Development Company. Vehicle composition containing 1-rubstituted azacyclononan-2-ones. 4,415,563., Cl. 424-244.000.

Rammelmeyr, Paul. Device for joining two single adhesive tapes to form a double adhesive tape. 4,415,400., Cl. 156-555.000.

Ramsey, Wallace B.: *See—*
Bush, Lee W.; Chan, Marie S.; Craun, Gary P.; Erlanson, William J.; Hunter, Wood E.; and Ramsey, Wallace B., 4,415,417., Cl. 204-159.240.

Ranpak Corp.: *See—*
Ottaviano, Gary W., 4,415,398., Cl. 156-470.000.

Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., to Wang Laboratories, Inc. Magnetic recording heads. 4,415,906., Cl. 346-74.500.

Rast, Gustaf J., Jr.: *See—*
Ashley, James R.; Barley, Thomas A.; and Rast, Gustaf J., Jr., 4,415,852., Cl. 324-57.00N.

Raty, Pertti T.: *See—*
Ross, John W.; and Raty, Pertti T., 4,415,795., Cl. 219-121.0PH.

Rawal, Bharat, to AVX Corporation. Rapid insulation resistance test for bismuth-containing ceramic capacitors. 4,414,844., Cl. 73-104.000.

Raychem Corporation: *See—*
Clabburn, Robin J. T.; and Stroessner, Rolf B., 4,415,217., Cl. 339-113.00L.

Raymond International Builders, Inc.: *See—*
Nelson Holland, Henry A.; and Bandura, James, 4,414,918., Cl. 118-306.000.
Phares, Lindsey J., 4,415,045., Cl. 175-9.000.

Raytheon Company: *See—*
Diesch, Bradford J.; and Fritts, Rex E., 4,415,790., Cl. 219-10.55B.
Matthews, James B.; and DeLuzio, Reno A., 4,415,266., Cl. 356-350.000.

RCA Corporation: *See—*
Botez, Dan; and Ettenberg, Michael, 4,416,012., Cl. 372-45.000.
Brooks, William C., 4,415,423., Cl. 204-212.000.
Davis, William J., 4,415,889., Cl. 340-728.000.
Dischert, Robert A., 4,415,931., Cl. 358-242.000.
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,415,832., Cl. 313-533.000.
Lewis, Henry G., Jr., 4,415,918., Cl. 358-23.000.
Olsen, Gregory H., 4,416,011., Cl. 372-45.000.
Prabhu, Ashok N.; and Hang, Kenneth W., 4,415,624., Cl. 428-209.000.
Strolle, Christopher H.; Smith, Terrence R.; and Reitmeier, Glenn A., 4,415,928., Cl. 358-140.000.
Willis, Donald H.; and Clayburn, Randall C., 4,415,841., Cl. 315-400.000.

Recane, Marion L.; Burns, William V.; McMillen, Charles E.; and Luce, Dan G., to Tideland Signal Corporation. Lampchanger. 4,415,951., Cl. 362-20.000.

Red Devil Inc.: *See—*
Heinis, Robert P.; and Vass, Eric, 4,415,270., Cl. 366-216.000.

Reddy, K. Prakash, to Schmid Laboratories, Inc. Spermicidally lubricated prophylactics and method for making same. 4,415,548., Cl. 424-28.000.

Redlich, Robert W., to United States of America, United States. Array for reducing the number of antenna elements for radiating instrument landing system localizer signals. 4,415,902., Cl. 343-844.000.

Reece, John W., to NCR Corporation. Ink jet transducer. 4,415,910., Cl. 346-140.00R.

Reen, Orville W., to Allegheny Ludlum Steel Corporation. Desulfurization process for ferrous powder. 4,415,527., Cl. 419-31.000.

Rees, James D.; and Durbin, John A., to Xerox Corporation. Linear lens array imaging system for forming reduced or enlarged images at an image plane. 4,415,258., Cl. 355-8.000.

Rees, Spencer C., to Wen Products, Inc. Portable workbench. 4,415,149., Cl. 269-88.000.

Regie Nationale des Usines Renault: *See—*
Bouthors, Pierre; and Breting, Olivier, 4,415,313., Cl. 417-38.000.

Rehm, William A.; Dareing, Donald W.; and Wood, Edward T. Triple branch completion with separate drilling and completion templates. 4,415,205., Cl. 299-5.000.

Rehwald, Willi: *See—*
Besemann, Alfred; and Rehwald, Willi, 4,414,873., Cl. 83-311.000.

Reich, Gregory N., to Allied Corporation. Forming of tetrabasic lead sulfate battery electrodes. 4,415,410., Cl. 204-2.100.

Reid, Glenn J. Reinforced molded rubber muffler hanger and method of making of same. 4,415,391., Cl. 156-187.000.

Reid, Robert: *See—*
Pyke, David R.; and Reid, Robert, 4,415,757., Cl. 568-475.000.

Reifsteck, Timothy: *See—*
Delfino, Michelangelo; and Reifsteck, Timothy, 4,415,794., Cl. 219-121.0LM.

Reinartz, Hans-Dieter; and Buerger, Magdalene, to ITT Industries, Inc. Fluid reservoir for a hydraulic brake system. 4,414,810., Cl. 60-535.000.

Reinking, Klaus: *See—*
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719., Cl. 528-167.000.

Reinshagen, Hellmuth: *See—*
Avar, Lajos; Kalt, Evelyne; and Reinshagen, Hellmuth, 4,415,687., Cl. 524-102.000.

Reithmeier, Gunter: *See—*
Kaczensky, Friedrich; Kroy, Walter; and Reithmeier, Gunter, 4,415,231., Cl. 350-269.000.

Reitmeier, Glenn A.: *See—*
Strolle, Christopher H.; Smith, Terrence R.; and Reitmeier, Glenn A., 4,415,928., Cl. 358-140.000.

Remet Corporation: *See—*
Feagin, Roy C., 4,415,673., Cl. 501-102.000.

Remy, Joel, to Adret Electronique. Microwave spectrum analyzer with a synthesized local oscillator. 4,415,854., Cl. 324-79.00R.

Reng, Alwin: *See—*
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,487., Cl. 252-546.000.
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,415,488., Cl. 252-547.000.

Renshaw, Carroll M.: *See*—
Curtis, Nikolaus A.; and Renshaw, Carroll M., 4,414,935., Cl. 123-198.00F.
Renton, Julian, to RWO (Marine Equipment) Limited. Assembly of turnable member and mounting therefor. 4,414,910., Cl. 114-218.000.
Replogle Globes, Inc.: *See*—
Riemer, Wolfgang J., 4,414,731., Cl. 29-453.000.
Reseal Corporation of America, The: *See*—
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,415,121., Cl. 239-229.000.
Research Corporation: *See*—
Anathasubramanian, Lakshminarayan; Kelly, T. Ross; and Vaya, Jacob, 4,415,498., Cl. 260-351.100.
Retzer, Michael H.: *See*—
Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,416,017., Cl. 375-99.000.
Reuter, Edward J., to Reuter, Inc. Hinge for container cover. 4,414,704., Cl. 16-223.000.
Reuter, Inc.: *See*—
Reuter, Edward J., 4,414,704., Cl. 16-223.000.
Reuter, Wolfgang: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,415,566., Cl. 424-246.000.
Reymond, Jean C.; and Gontier, Maurice, to Thomson-CSF. Cartographic indicator. 4,415,922., Cl. 358-22.000.
Rezakhany, Saeed, to Wisconsin Alumni Research Foundation. Nasal dilator. 4,414,977., Cl. 128-342.000.
Rezewski, Joe; and Bernes, Wayne. Roller guide for oil-well pump. 4,415,026., Cl. 166-97.000.
Rheem Manufacturing Company: *See*—
Daugirda, Paul G., 4,415,020., Cl. 165-76.000.
Rhodes, Donald E., to Kerr-McGee Corporation. Process for the separation of entrained organic fluids from gaseous streams in a coal deashing system. 4,415,442., Cl. 208-177.000.
Rhone-Poulenc Industries: *See*—
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,562., Cl. 424-246.000.
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,735., Cl. 544-22.000.
Foucras, Jacques; and Rodet, Georges, 4,415,447., Cl. 210-321.100.
Rice, E. Dale: *See*—
McNesky, Guy P.; and Rice, E. Dale, 4,415,075., Cl. 202-177.000.
Richards, Peter K.; and Hamilton, Harry J. Block for supporting the poles of equestrian fences. 4,414,920., Cl. 119-29.000.
Richardson-Vicks Inc.: *See*—
Shah, Nutan B.; and Cook, Marvin K., 4,415,549., Cl. 424-52.000.
Richardson, William S.: *See*—
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969., Cl. 364-200.000.
Richeson, W. George: *See*—
Dotson, Robert S.; Richeson, W. George; and Trenka, Herb M., 4,414,974., Cl. 128-305.000.
Richmond, Wesley Q., to Kennecott Corporation. Process for making oxide refractory material having fine crystal structure. 4,415,510., Cl. 264-8.000.
Ricoh Co., Ltd.: *See*—
Kawanishi, Toshiyuki; and Tabata, Yukio, 4,415,903., Cl. 346-1.100.
Kurotori, Tsuneo; Mochizuki, Manabu; and Tatsumi, Susumu, 4,415,533., Cl. 422-4.000.
Satomi, Toyokazu, 4,415,259., Cl. 355-11.000.
Shinohara, Hiroichi, 4,415,241., Cl. 350-476.000.
Ridley, Robert R., to Ex-Cell-O Corporation. Tool and method for crowning teeth. 4,414,729., Cl. 29-159.200.
Riedinger, Franz W., to Deere & Company. Hinge arrangement for an articulated combine. 4,414,794., Cl. 56-16.600.
Riegl, Ivan, to International Standard Electric Corporation. Process of etching glass surfaces, particularly in the manufacture of optical waveguides. 4,415,404., Cl. 156-635.000.
Riemer, Wolfgang J., to Replogle Globes, Inc. Method of manufacture of raised relief illuminated globe. 4,414,731., Cl. 29-453.000.
Riepe, Georg: *See*—
Protic, Davor; and Riepe, Georg, 4,415,916., Cl. 357-29.000.
Rieter Machine Works Limited: *See*—
Schwengeler, Peter, 4,415,125., Cl. 242-18.0DD.
Ring, Lawrence S.: *See*—
Daisley, Richard J.; and Ring, Lawrence S., 4,415,330., Cl. 433-16.000.
Ringe, Thomas. Support means and system for supporting mine roofs. 4,415,294., Cl. 405-259.000.
Rippel, Wally E.; and Edwards, Dean B., to California Institute of Technology. FET commutated current-FED inverter. 4,415,963., Cl. 363-135.000.
Rivier, Catherine L.: *See*—
Vale, Wylie W., Jr.; Spiess, Joachim; Rivier, Catherine L.; and Rivier, Jean E. F., 4,415,558., Cl. 424-177.000.
Rivier, Jean E. F.: *See*—
Vale, Wylie W., Jr.; Spiess, Joachim; Rivier, Catherine L.; and Rivier, Jean E. F., 4,415,558., Cl. 424-177.000.
Robbins, Jeffrey D., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,415,503., Cl. 260-502.50F.
Roberge, Jean M.: *See*—
Garner, John N.; Roberge, Jean M.; and Baxter, Douglas G., 4,414,802., Cl. 57-293.000.
Robert Bosch GmbH: *See*—
Daumer, Rolf; Klotzner, Winfried; and Schenk, Manfred, 4,414,946., Cl. 123-417.000.
Heitmann, Jurgen, 4,415,938., Cl. 360-53.000.
Hofmann, Karl, 4,414,845., Cl. 73-119.00A.
Holzbaur, Siegfried, 4,414,948., Cl. 123-452.000.
Honig, Gunther; Kiencke, Uwe; and Schulz, Alfred, 4,414,949., Cl. 123-479.000.
Kudelski, Stefan; and Schlup, Jean-Claude, 4,415,912., Cl. 346-154.000.
Kuhlmann, Gerhard; and Wolf, Erwin, 4,414,745., Cl. 30-373.000.
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., to Phillips Petroleum Company. Cracking catalyst improvement with gallium compounds. 4,415,440., Cl. 208-120.000.
Roberts, William J.: *See*—
Grunden, Michael T.; and Roberts, William J., 4,415,328., Cl. 431-1.000.
Robinette, James A.: *See*—
Ferrell, Robert A.; and Robinette, James A., 4,415,386., Cl. 156-64.000.
Robins, David S.: *See*—
Jasper, Steven C.; Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,416,017., Cl. 375-99.000.
Robinson, Graham; Ansell, Raymond O.; and McNamee, Michael, to Chloride Silent Power Limited. Cathode electrode structures for sodium sulphur cells and their manufacture. 4,415,637., Cl. 429-218.000.
Rockwell International Corporation: *See*—
Gergis, Isoris S.; and Lee, Wai-Tak P., 4,415,990., Cl. 365-41.000.
Huffman, Charles E.; and Southerland, Stephen R., 4,416,009., Cl. 370-100.000.
McKenzie, Robert W., 4,415,218., Cl. 339-147.00R.
Shutt, Sidney G., 4,414,848., Cl. 73-497.000.
Soclof, Sidney I., 4,415,371., Cl. 148-1.500.
Thornton, Jack C.; and Russell, Randy G., 4,415,873., Cl. 336-139.000.
Rodet, Georges: *See*—
Foucras, Jacques; and Rodet, Georges, 4,415,447., Cl. 210-321.100.
Rodowsky, Stanley, Jr.: *See*—
Overy, Colin; Langenberg, Anthony J.; Powell, Arthur; and Rodowsky, Stanley, Jr., 4,414,781., Cl. 51-170.0MT.
Roes, Augustinus W. M.: *See*—
Van Hattem, Arie; Prommel, Johan A.; and Roes, Augustinus W. M., 4,415,445., Cl. 209-5.000.
Rogers Corporation: *See*—
Daugherty, James B.; and Balash, Frederick A., 4,415,780., Cl. 200-5.00A.
Rogers, Melvin F., to Zenith Radio Corporation. CRT Mounting and implosion-protection means and method. 4,415,932., Cl. 358-246.000.
Rohm and Haas Company: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,415,354., Cl. 71-103.000.
Osei-Gyimah, Peter; Cartier, Peter G.; and Ellis, Paul E., 4,415,455., Cl. 210-654.000.
Staas, William H., 4,415,706., Cl. 525-183.000.
Rohr, Harry: *See*—
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, 4,415,719., Cl. 528-167.000.
Rohrbach, Ronald P.; and Maliarik, Mary J., to UOP Inc. Increasing the stability of amyloglucosidase. 4,415,656., Cl. 435-96.000.
Rohrig, Herbert: *See*—
Beck, Jurgen; and Rohrig, Herbert, 4,415,811., Cl. 250-560.000.
Rohrman, Albert C., Jr.: *See*—
Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,415,544., Cl. 423-328.000.
Roiko, Russell A.; and Pokorny, Richard J., to Minnesota Mining and Manufacturing Company. Contact enhancing composition. 4,415,694., Cl. 524-200.000.
Roland, Manfred W.; and Roland, Max G., to All-Lock Electronics, Inc. Door control system. 4,415,893., Cl. 340-825.310.
Roland, Max G.: *See*—
Roland, Manfred W.; and Roland, Max G., 4,415,893., Cl. 340-825.310.
Rolli, Hans P.: *See*—
de Weck, Alain L.; Schneider, Conrad H.; and Rolli, Hans P., 4,415,492., Cl. 260-112.50R.
Rolls-Royce Limited: *See*—
Atterbury, Leslie G., 4,415,309., Cl. 415-170.00R.
Romagnoli, Andrea, to Ima-Industria Macchine Automatiche-S.p.A. Filter-bag for infusion products. 4,415,597., Cl. 426-394.000.
Romanenko, Oleg N.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Romine, Donnie; and Woodard, Harry L., to Champion International Corporation. Slitter blade carrying case. 4,415,080., Cl. 206-303.000.
Ronkainen, Pentti P.; Leppanen, Olavi A.; Harju, Kai J.; and Erapolku, Pertti J., to Oy Alko AB. Method for mashing starch-rich material for alcohol production. 4,415,659., Cl. 435-161.000.
Rose, John B., to Imperial Chemical Industries PLC. Production of aromatic polysulphones. 4,415,720., Cl. 528-171.000.

Rose, Thomas A.: *See—*
Heil, Richard W.; and Rose, Thomas A., 4,415,452., Cl. 210-614.000.
Rosenberg, Benjamin. Method and apparatus for scoring plastic sheet material. 4,415,515., Cl. 264-68.000.
Rosenberger, Leonard S., to Kaydee Engineering, Inc. Heat transfer apparatus for transportable liquid containers. 4,415,018., Cl. 165-41.000.
Ross, John W.; and Raty, Pertti T., to Union Carbide Canada Limited. Torch support and height sensor apparatus for shape cutting machines. 4,415,795., Cl. 219-121.0PH.
Rossmann, Dieter; Donn, Volker; and Ludwig, Christian, to Carl-Zeiss-Stiftung. Focusing system for long focal length objectives. 4,415,250., Cl. 354-195.000.
Rossow, Harold E.: *See—*
Lane, George A.; and Rossow, Harold E., 4,415,466., Cl. 252-70.000.
Rothwell, Harold L., Jr.; English, George J.; and Keeffe, William M., to GTE Products Corporation. Direct current operable arc lamp. 4,415,829., Cl. 313-621.000.
Roy, Pierre L.: *See—*
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,562., Cl. 424-246.000.
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,415,735., Cl. 544-22.000.
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J. Catalyst for dehydrogenation oxygen-containing derivatives of the cyclohexane series into the corresponding cyclic ketones and/or phenols. 4,415,477., Cl. 502-178.000.
Rubin, David, to United States of America, Navy. Hybrid coupled microstrip amplifier. 4,415,867., Cl. 330-287.000.
Rudakov, Viktor A.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Ruddle, Frank H.; and Lin, Pin-Fang, to Yale University. Method for engraving a grid pattern on microscope slides and slips. 4,415,405., Cl. 156-645.000.
Rudler, Helmut; and Williams, Ralph J., to Dentsply Research & Development Corp. Air gap system to maintain pure liquid supplies. 4,414,998., Cl. 137-216.000.
Ruffa, Rose. Suture and surgical accessory rack. 4,415,089., Cl. 211-13.000.
Ruiz, Joseph. Chromatic harmonica with remote actuator. 4,414,879., Cl. 84-379.000.
Rupinski, Frederick A.: *See—*
Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906., Cl. 346-74.500.
Russell, Joseph W. Hair fluffing device. 4,414,992., Cl. 132-129.000.
Russell, Larry R. Accumulator recharging valve. 4,415,027., Cl. 166-113.000.
Russell, Randy G.: *See—*
Thornton, Jack C.; and Russell, Randy G., 4,415,873., Cl. 336-139.000.
Russell, Robinson C., to Automation Industries, Inc. Multi-axis controller. 4,415,967., Cl. 364-168.000.
Russtech Engineering Company, Inc.: *See—*
Fieberg, Russell F.; and Fieberg, Donald E., 4,414,736., Cl. 29-747.000.
Rutgerswerke Aktiengesellschaft: *See—*
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,415,429., Cl. 208-8.0LE.
RWO (Marine Equipment) Limited: *See—*
Renton, Julian, 4,414,910., Cl. 114-218.000.
Ryder, Francis E.; and Thomas, Michael D., to Ryder International Corp. Blood lancet. 4,414,975., Cl. 128-314.000.
Ryder International Corp.: *See—*
Ryder, Francis E.; and Thomas, Michael D., 4,414,975., Cl. 128-314.000.
Ryon, Allen D.: *See—*
Haas, Paul A.; and Ryon, Allen D., 4,415,536., Cl. 422-159.000.
Ryu, Ji-Yong; and Brownstein, Arthur M., to Exxon Research & Engineering Co. Process for the preparation of aromatic carbamates and isocyanates. 4,415,745., Cl. 560-25.000.
S. A. Panmedica: *See—*
Laruelle, Claude; and Lepant, Marcel, 4,415,574., Cl. 424-251.000.
SAB Nife AB: *See—*
Melin, Ake L., 4,415,541., Cl. 423-140.000.
Sachs Systemtechnik GmbH: *See—*
Fuglein, Egon, 4,415,619., Cl. 428-131.000.
Sadao, Tanaka: *See—*
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
Safetran Systems Corporation: *See—*
Wilson, H. James, 4,415,134., Cl. 246-34.0CT.
Sahatjian, Ronald A.: *See—*
Bilofsky, Ruth C.; and Sahatjian, Ronald A., 4,415,648., Cl. 430-220.000.
Saint-Gobain Vitrage: *See—*
Baum, Hans; and Balling, Egbert, 4,415,196., Cl. 296-201.000.
Saipem S.p.A.: *See—*
Maestrami, Marino, 4,415,186., Cl. 285-142.000.
Saito, Isao: *See—*
Machida, Yoshimasa; Saito, Isao; Nomoto, Seiichiro; Negi, Shigeto; Ikuta, Hironori; and Kitoh, Kyosuke, 4,415,567., Cl. 424-246.000.
Saito, Osamu; Homma, Hideo; Inoue, Hirokazu; and Momma, Naohiro, to Hitachi, Ltd. Diffusion of impurities into semiconductor using semi-closed inner diffusion vessel. 4,415,385., Cl. 148-189.000.
Saito, Takashi; and Kumaki, Takashi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus having a lid member guiding mechanism. 4,416,004., Cl. 369-77.200.
Saito, Tsutomu: *See—*
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, 4,415,877., Cl. 338-34.000.
Saitoh, Shinji: *See—*
Menjo, Atsuhiko; and Saitoh, Shinji, 4,414,737., Cl. 29-578.000.
Sakai, Kazushige: *See—*
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
Sakai, Masaaki: *See—*
Yamagata, Seiichi; and Sakai, Masaaki, 4,415,611., Cl. 428-15.000.
Sakai, Shinji: *See—*
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924., Cl. 358-50.000.
Sakai, Yukio: *See—*
Ayame, Akimi; Nojiri, Naohiro; and Sakai, Yukio, 4,415,476., Cl. 502-224.000.
Sakakibara, Hideo: *See—*
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730., Cl. 536-7.100.
Sakakibara, Toshimitsu: *See—*
Yamada, Shigeo; Takawashi, Tamio; and Sakakibara, Toshimitsu, 4,415,791., Cl. 219-69.00G.
Sakamoto, Koji, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Dual conductor current access magnetic bubble memory. 4,415,989., Cl. 365-19.000.
Sakimura, Shigeki: *See—*
Ono, Katsuhiro; and Sakimura, Shigeki, 4,415,702., Cl. 524-705.000.
Sakodynsky, Karl I.: *See—*
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.
Sakurada, Morikatsu: *See—*
Nishimura, Mitsuhiko; and Sakurada, Morikatsu, 4,415,359., Cl. 75-60.000.
Sakurai, Isao: *See—*
Yukawa, Koji; Murahashi, Takashi; and Sakurai, Isao, 4,415,261., Cl. 355-75.000.
Sakurai, Yoshihiro, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Lubrication system for two-cycle internal combustion engines. 4,414,929., Cl. 123-73.00R.
Sala, Angelo: *See—*
Priaroggia, Paolo G.; Bianchi, Giuseppe; and Sala, Angelo, 4,415,764., Cl. 174-37.000.
Salee, Gideon: *See—*
Kosanovich, George M.; and Salee, Gideon, 4,415,721., Cl. 528-176.000.
Salk Institute for Biological Studies, The: *See—*
Vale, Wylie W., Jr.; Spiess, Joachim; Rivier, Catherine L.; and Rivier, Jean E. F., 4,415,558., Cl. 424-177.000.
Salmen, Leo A.: *See—*
Kiczek, Alexander P.; Salmen, Leo A.; and Tower, Clark B., 4,415,489., Cl. 252-558.000.
Salomon, Georges P. J.; and Leveque, Alain, to Etablissements Francois Salomon & Fils. Slipper for a ski boot, and process for its manufacture. 4,414,762., Cl. 36-117.000.
Salter, Robert S.: *See—*
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,415,540., Cl. 423-99.000.
Saltveit, Mikal E., Jr.: *See—*
Dilley, David R.; Lee, Julian J. L.; and Saltveit, Mikal E., Jr., 4,414,839., Cl. 73-23.000.
Salva, Henri E., to International Harvester Co. Fully mounted variable width plow. 4,415,040., Cl. 172-225.000.
Sambucetti, Carlos J.: *See—*
Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., 4,415,905., Cl. 346-1.100.
Sanderson, William R.: *See—*
Daly, William T.; Gelman, Boris; and Sanderson, William R., 4,415,244., Cl. 353-101.000.
Sandoz, Inc.: *See—*
Barcza, Sandor, 4,415,560., Cl. 424-184.000.
Brand, Leonard J.; and Nadelson, Jeffrey, 4,415,568., Cl. 424-248.400.
Sandoz Ltd.: *See—*
Avar, Lajos; Kalt, Evelyne; and Reinshagen, Hellmuth, 4,415,687., Cl. 524-102.000.
Sandstedt, Gary O. Restaurant or retail vending facility. 4,415,065., Cl. 186-39.000.
Saneto, Frank. Vehicle fuel conditioning apparatus. 4,414,951., Cl. 123-538.000.

Sanftleben, Keith E.; and Tarr, Walter R., to Bendix Corporation, The. Sintered iron base friction material. 4,415,363., Cl. 75-229.000.
Sank, Victor: *See*—
Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, 4,415,807., Cl. 250-363.00S.
Sankyo Manufacturing Company, Ltd.: *See*—
Katoh, Heizaburou, 4,415,108., Cl. 226-138.000.
Sano, Noritoshi: *See*—
Suzuki, Suguru; Sano, Noritoshi; and Tajima, Tetsuya, 4,415,559., Cl. 424-183.000.
Sano, Yoshikazu: *See*—
Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, 4,414,732., Cl. 29-568.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Nakada, Hiroyasu, 4,414,928., Cl. 123-73.0PP.
Sakurai, Yoshihiro, 4,414,929., Cl. 123-73.00R.
Santis, Dean C.: *See*—
Sievers, Kirk A.; and Santis, Dean C., 4,415,849., Cl. 322-99.000.
Santucci, Lawrence E.: *See*—
Spars, Byron G.; and Santucci, Lawrence E., 4,415,365., Cl. 106-85.000.
Sanyo Electric Co., Inc.: *See*—
Ugari, Takenori; and Yano, Yoichi, 4,416,024., Cl. 455-303.000.
Sarda, Jean L. Thermo-engraving machine for printing in relief. 4,414,913., Cl. 118-46.000.
Sarkar, Sunil B., to Firestone Tire & Rubber Company, The. Method for preparing color-free, stabilized polymers of conjugated dienes or vinyl aromatic hydrocarbons or copolymers of conjugated dienes and vinyl aromatic hydrocarbons. 4,415,695., Cl. 524-405.000.
Sasagawa, Kinichi: *See*—
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,415,620., Cl. 428-157.000.
Sasaki, Osamu: *See*—
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59.000.
Sasanuma, Yasutomo, to Citizen Watch Co., Ltd. Process for manufacturing ornamental parts and ion plating apparatus to be used therefor. 4,415,421., Cl. 204-192.00N.
Sasscer, Lawrence D.: *See*—
Swenson, Robert E.; Sasscer, Lawrence D.; and George, Benjamin T., 4,415,970., Cl. 364-200.000.
Sastry, Shankar M.: *See*—
Lede², Jh, Richard J.; and Sastry, Shankar M., 4,415,375., Cl. 148-11.50F.
Sato, Hideo: *See*—
Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, 4,415,726., Cl. 528-272.000.
Sato, Masayoshi; and Suzuki, Kunio, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Inking mechanism in a rotary press. 4,414,897., Cl. 101-216.000.
Sato, Michio: *See*—
Nakazawa, Kogi; Sato, Michio; Kasai, Shin; Kawaguchi, Yutaka; and Kikuchi, Toshiaki, 4,415,126., Cl. 242-43.00R.
Sato, Yasushi: *See*—
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920., Cl. 358-37.000.
Satomi, Toyokazu, to Ricoh Company, Ltd. Variable magnification and reciprocal exposure copying method. 4,415,259., Cl. 355-11.000.
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, to Godecke Aktiengesellschaft. 5,6;8,9-Tetrahydro-7H-dibenz(d,f)azonines. 4,415,495., Cl. 260-239.00D.
Saunders, William T., to National Steel Corporation. Method of and apparatus for deep drawing metal containers. 4,414,836., Cl. 72-349.000.
Sauvago, Phillip J., to Farmland Foods, Inc. Automatic livestock head splitter. 4,414,708., Cl. 17-1.00R.
Sawada, Kiyoshi: *See*—
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59.000.
Sawamura, Mitsuharu: *See*—
Itoh, Susumu; and Sawamura, Mitsuharu, 4,415,233., Cl. 350-173.000.
Sawruk, Stephen: *See*—
Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,415,544., Cl. 423-328.000.
Sayko, Steven P.: *See*—
Italiano, Victor J.; and Sayko, Steven P., 4,415,909., Cl. 346-140.00R.
Schacht, Charles A., to United States Steel Corporation. Conductor roll contour. 4,415,425., Cl. 204-279.000.
Schadlich, Gunther: *See*—
Dryczynski, Kurt; Schadlich, Gunther; and Moraw, Roland, 4,415,947., Cl. 361-235.000.
Schaefer, Roger W., to Centurion Safety Products, Inc. Grip shield. 4,415,954., Cl. 362-202.000.
Schafer, Otto: *See*—
Emmenthal, Klaus-Dieter; Schafer, Otto; and Strozyk, Rudolf-Helmut, 4,414,944., Cl. 123-339.000.
Schaffner, Kurt: *See*—
Demuth, Martin; and Schaffner, Kurt, 4,415,756., Cl. 568-365.000.
Scharfe, James A., Jr. Power supply. 4,415,964., Cl. 363-142.000.
Scharpf, William G.; and Glenn, Michael S., to FMC Corporation. Intermediates for insecticidal synthetic pyrethroids. 4,415,748., Cl. 560-227.000.
Schegolev, Vladimir I.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Schenk, Manfred: *See*—
Daumer, Rolf; Klotzner, Winfried; and Schenk, Manfred, 4,414,946., Cl. 123-417.000.
Schenk, Raymond L.: *See*—
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,415,016., Cl. 164-429.000.
Scherbatskoy, Serge A. System for employing high temperature batteries for making measurements in a borehole. 4,416,000., Cl. 367-81.000.
Scherberich, Paul: *See*—
Martens, Jurgen; Scherberich, Paul; Bethge, Horst; and Kleemann, Axel, 4,415,738., Cl. 548-147.000.
Scherling, J. Daniel: *See*—
Iezza, Franco S., 4,415,150., Cl. 272-63.000.
Schick, Martin J.; and Knitter, Kathy A., to Diamond Shamrock Corporation. Aqueous carbonaceous slurries. 4,415,338., Cl. 44-51.000.
Schiel, Christian; and Wolf, Robert, to J. M. Voith GmbH. Press roll with adjustable flexion. 4,414,890., Cl. 100-162.00B.
Schierl, Ludwig: *See*—
Simpson, Carroll; and Schierl, Ludwig, 4,414,756., Cl. 34-23.000.
Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG. Needle selection device for a knitting machine. 4,414,806., Cl. 66-75.200.
Schindler, Rudolf: *See*—
Brunsch, Klaus; and Schindler, Rudolf, 4,414,860., Cl. 74-579.00E.
Schippers, Heinz: *See*—
Dammann, Peter; Schippers, Heinz; and Bauer, Karl, 4,414,803., Cl. 57-340.000.
Schlaepfer, Robert J., to Jacob Schlaepfer & Co. AC. Decoration of sheet material. 4,415,623., Cl. 428-200.000.
Schlafer, Ludwig; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Solid compositions of water-soluble fiber-reactive dyestuffs and dialkylnaphthalene sulfonic acid and formaldehye condensate. 4,415,333., Cl. 8-524.000.
Schlage Lock Company: *See*—
Schnarr, Raymond H.; and Zunkel, Richard L., 4,414,703., Cl. 16-52.000.
Schleimer, Francois: *See*—
Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358., Cl. 75-58.000.
Schley, Robert: *See*—
Lacoste, Jean-Andre; Leveque, Jeaqn-Pierre; and Schley, Robert, 4,415,758., Cl. 136-233.000.
Schlumberger Technology Corp.: *See*—
Blizard, Robert B., 4,415,998., Cl. 367-25.000.
Schlup, Jean-Claude: *See*—
Kudelski, Stefan; and Schlup, Jean-Claude, 4,415,912., Cl. 346-154.000.
Schmid Laboratories, Inc.: *See*—
Reddy, K. Prakash, 4,415,548., Cl. 424-28.000.
Schmidt, Delf: *See*—
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557., Cl. 424-172.000.
Schmidt, Hans; and Wolff, Robert A., to Matsushita Electric Industrial Co., Ltd. Adjustable potentiometer assembly for tuning multi-band television receivers. 4,415,930., Cl. 358-191.100.
Schmidt, Manfred; Bottenbruch, Ludwig; Freitag, Dieter; Reinking, Klaus; Rohr, Harry; and Block, Hans-Dieter, to Bayer Aktiengesellschaft. Thermoplastic, branched aromatic polyphosphonates, and a process for their production. 4,415,719., Cl. 528-167.000.
Schmitz, Gerd, to Sulzer Brothers Limited. Retractor apparatus for a weft-inserting projectile in a weaving machine. 4,415,010., Cl. 139-439.000.
Schmuck, Phillip W., to Baker International Corporation. Formation protection valve apparatus and method. 4,415,038., Cl. 166-373.000.
Schnarr, Raymond H.; and Zunkel, Richard L., to Schlage Lock Company. Door closer and holder. 4,414,703., Cl. 16-52.000.
Schneider, Conrad H.: *See*—
de Weck, Alain L.; Schneider, Conrad H.; and Rolli, Hans P., 4,415,492., Cl. 260-112.50R.
Schneider, Jochen: *See*—
Hinkel, Holger; Kuenzel, Ulrich; Max, Erhard; and Schneider, Jochen, 4,415,634., Cl. 428-579.000.
Schober, Annette: *See*—
Pioch, Peter P.; and Schober, Annette, 4,414,743., Cl. 30-124.000.
Schoenig, Darrell A. Portable volleyball apparatus. 4,415,163., Cl. 273-411.000.
Schoofs, Franciscus A. C. M.: *See*—
Nijman, Aloysius J.; and Schoofs, Franciscus A. C. M., 4,415,775., Cl. 179-78.00R.
Schopper, Bernd, to ITT Industries, Inc. An integral wheel brake cylinder and pressure regulating valve. 4,415,209., Cl. 303-6.00C.
Schrenkel, Jack: *See*—
Dublin, Wilbur L., Jr.; and Schrenkel, Jack, 4,414,846., Cl. 73-151.000.

Schroder, Theo: *See*—
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557., Cl. 424-172.000.
Schulz, Alfred: *See*—
Honig, Gunther; Kiencke, Uwe; and Schulz, Alfred, 4,414,949., Cl. 123-479.000.
Schumacher, Ignatius; and Wang, Kang-Bo, to Monsanto Company. Vapor phase nitration of aromatic compounds. 4,415,744., Cl. 560-20.000.
Schur, Inc.: *See*—
Collins, Walter W., 4,414,744., Cl. 30-151.000.
Schuss, Jack A.: *See*—
Delin, Michael A.; and Schuss, Jack A., 4,415,884., Cl. 340-500.000.
Schutijser, Jan A. J., to Akzo. Porous inorganic support material coated with an organic stationary phase, for use in chromatography, and process for its preparation. 4,415,631., Cl. 428-405.000.
Schutte, Manfred: *See*—
Behrenz, Wolfgang; Schutte, Manfred; and Naumann, Klaus, 4,415,561., Cl. 424-219.000.
Schwartz, Michael A.; and Yamagata, Toshio, to Press Machinery Corporation of Illinois. Method and apparatus for conversion of a printing press to offset printing. 4,414,895., Cl. 101-177.000.
Schwartz, Wesley W., to Square D Company. Patient light with hanger and hinge arrangement for removal without tools. 4,415,957., Cl. 362-297.000.
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, to Immuno Aktiengesellschaft fur chemischmedizinische Produkte. Tissue adhesive. 4,414,976., Cl. 128-334.00R.
Schweigert, Lothar L.; and Paik, Stephen R. Lid and seal for jar. 4,415,095., Cl. 215-329.000.
Schwengeler, Peter, to Rieter Machine Works Limited. Apparatus for winding a thread. 4,415,125., Cl. 242-18.0DD.
Schwob, Pierre, to SEB S.A. Steam iron sole plate design. 4,414,766., Cl. 38-77.830.
SCM Corporation: *See*—
Miller, Donald E.; and Werstak, Charles E., 4,415,600., Cl. 426-613.000.
Scoggins, Lacey E.; and Munro, Bradley L., to Phillips Petroleum Company. Recovering granular poly(arylene sulfide) particles from a poly(arylene sulfide) reaction mixture. 4,415,729., Cl. 528-388.000.
Scott, Waller M., Jr., to Scovill Inc. Musical door chime preferably also combined with a clock for annunciating the time. 4,414,877., Cl. 84-1.130.
Scott, Warner C., to Texas Instruments Incorporated. Character recognition method and apparatus. 4,415,880., Cl. 382-27.000.
Scovill Inc.: *See*—
Scott, Waller M., Jr., 4,414,877., Cl. 84-1.130.
Scripps Clinic and Research Foundation: *See*—
Weigle, William O.; and Morgan, Edward L., 4,415,493., Cl. 260-112.50R.
SEB S.A.: *See*—
Schwob, Pierre, 4,414,766., Cl. 38-77.830.
Sebald, Robert H.: *See*—
Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., 4,414,715., Cl. 24-283.000.
Seelich, Thomas: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,414,976., Cl. 128-334.00R.
Seelye, William P.: *See*—
McCall, Charles F.; and Seelye, William P., 4,415,181., Cl. 280-700.000.
Seienia, Industrie Elettroniche Associate, S.p.A.: *See*—
Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, 4,415,304., Cl. 414-589.000.
Seirei Industry Company Limited: *See*—
Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088., Cl. 209-687.000.
Sekiya, Toshifumi: *See*—
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, 4,415,877., Cl. 338-34.000.
Sellwood, Raymund E., to M.L. Aviation Company Limited. Explosive device including an ignition circuit monitor. 4,414,901., Cl. 102-206.000.
Senda, Kenichi: *See*—
Ushirokawa, Masahiro; Iwahama, Takeshi; and Senda, Kenichi, 4,415,680., Cl. 521-56.000.
Seragnoli, Enzo, to G. D Societa' per Azioni. Method and device for replacing a first, nearly empty reel of strip material with a second, new reel. 4,415,127., Cl. 242-58.100.
Seton Company: *See*—
Cioca, Gheorge; Feeley, George F.; Brabson, Joseph B.; and Barth, Peter, 4,415,628., Cl. 428-335.000.
Setzer, Herbert J.; Lesieur, Roger R.; and Karavolis, Sam, to United Technologies Corporation. Autothermal reforming catalyst. 4,415,484., Cl. 502-332.000.
Setzer, Herbert J.: *See*—
Vine, Raymond W.; Trocciola, John C.; and Setzer, Herbert J., 4,415,537., Cl. 422-180.000.
Shafer, Merrill W.: *See*—
Mitchell, Joseph W.; Shafer, Merrill W.; and Sambucetti, Carlos J., 4,415,905., Cl. 346-1.100.
Shah, Nutan B.; and Cook, Marvin K., to Richardson-Vicks Inc. Toothpastes with reduced salinity. 4,415,549., Cl. 424-52.000.
Shapiro, Jules S., to Minnesota Mining and Manufacturing Company. Internal fixation of bone, tendon, and ligaments. 4,414,967., Cl. 128-92.00B.
Shapiro, Justin J.; and MacDermott, Bruce R. Incremental liquid dispensing device. 4,415,101., Cl. 222-288.000.
Shapland, Earl P.; and King, Patrick D., to USS Engineers and Consultants, Inc. Full throttle valve and method of tube and gate change. 4,415,103., Cl. 222-590.000.
Sharon Manufacturing Company: *See*—
Hudson, Sharon J., Jr., 4,415,187., Cl. 285-173.000.
Sharp Kabushiki Kaisha: *See*—
Kawase, Yoshitaka, 4,415,887., Cl. 340-635.000.
Suzuki, Hiroyuki, 4,416,003., Cl. 369-75.200.
Shaw, Henry A., to N. V. Weefautomaten Picanol. Weft inserting device for pneumatic weaving looms. 4,415,009., Cl. 139-435.000.
Shaw, Jonathan L., to Western Electric Company, Incorporated. Ladder foot. 4,415,062., Cl. 182-109.000.
Shell Oil Company: *See*—
Engel, Robert F.; Long, Thomas E.; and Warrington, Ralph M., 4,415,293., Cl. 405-216.000.
Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,415,675., Cl. 518-715.000.
Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,415,676., Cl. 518-715.000.
Van Hattem, Arie; Prommel, Johan A.; and Roes, Augustinus W. M., 4,415,445., Cl. 209-5.000.
Shenvi, Ashokkumar B.: *See*—
Ciganek, Engelbert; and Shenvi, Ashokkumar B., 4,415,736., Cl. 546-283.000.
Shepherd, Lloyd: *See*—
Lai, Juey H.; Douglas, Richard; and Shepherd, Lloyd, 4,415,653., Cl. 430-296.000.
Shepherd, William C. Tree-like decorative device. 4,415,953., Cl. 362-32.000.
Sheppard, David P. Dart target system. 4,415,162., Cl. 273-371.000.
Sherwood, John R., to AMF Incorporated. Ground conductor monitoring system. 4,415,850., Cl. 324-51.000.
Shew, David S. System for setting sheet-form type. 4,415,253., Cl. 354-292.000.
Shibata, Akira, to Chugai Denki Kogyo K.K. Method of making composite electrical contact. 4,414,742., Cl. 29-882.000.
Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,415,688., Cl. 524-102.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Shibata, Toshihiro, 4,415,689., Cl. 524-103.000.
Shibata, Yoshihisa: *See*—
Enomoto, Hiroshi; Nomura, Akira; Aoyagi, Yoshiaki; and Shibata, Yoshihisa, 4,415,570., Cl. 424-249.000.
Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Swash-plate type compressor having an improved lubricant oil feeding arrangement. 4,415,315., Cl. 417-269.000.
Shields, John. Electro-optical analyzer for measuring percentage by weight of fat, protein and lactose in milk. 4,415,809., Cl. 250-432.00R.
Shimada, Toshio: *See*—
Toga, Yuzo; Shimada, Toshio; and Okamoto, Ichiro, 4,415,727., Cl. 528-272.000.
Shimazaki, Kanzo: *See*—
Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088., Cl. 209-687.000.
Shimura, Takaki: *See*—
Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,414,850., Cl. 73-599.000.
Shinagawa, Akihiro: *See*—
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,415,411., Cl. 204-29.000.
Shindo, Minoru: *See*—
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
Shinoda, Nobuhiko: *See*—
Kawabata, Takashi; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; and Hosoe, Kazuya, 4,415,924., Cl. 358-50.000.
Shinohara, Hiroichi, to Ricoh Co., Ltd. Tessor type lens systems for facsimile. 4,415,241., Cl. 350-476.000.
Shinozaki, Fumiaki: *See*—
Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,415,650., Cl. 430-273.000.
Shipley, Randall S.; and Freyer, Larry E., to Dow Chemical Company, The. Polymerizing olefins with catalysts containing the reaction product of a transition metal compound and a boron compound. 4,415,712., Cl. 526-122.000.
Shirai, Tatsunori: *See*—
Kagawa, Shuzo; Shirai, Tatsunori; Kaneda, Takao; and Baba, Yasuo, 4,415,370., Cl. 148-1.500.
Shiraki, Yasuyuki: *See*—
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
Shirk, Michael H., to United States of America, Air Force. Aircraft having variable incidence forward-swept wing. 4,415,132., Cl. 244-48.000.

Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, to Hitachi, Ltd. Process for treating liquid waste containing solid fine particles. 4,415,457., Cl. 210-682.000.

Shoji, Masao; and Kinoshita, Yoshio, to NSK-Warner K. K. One-way clutch. 4,415,072., Cl. 192-45.000.

Short, Michael R.: *See—*
Munger, Stanley H.; Short, Michael R.; and Swatton, David W., 4,415,649., Cl. 430-271.000.

Shu, Winston R., to Mobil Oil Corporation. Carbonated waterflooding for viscous oil recovery using a CO_2 solubility promoter and demoter. 4,415,032., Cl. 166-273.000.

Shulman, Elliott: *See—*
Osrow, Harold; and Shulman, Elliott, 4,415,323., Cl. 425-72.00S.

Shutt, Sidney G., to Rockwell International Corporation. Three-axis accelerometer. 4,414,848., Cl. 73-497.000.

Siegel, Don L., to President and Fellows of Harvard College. Cell culture. 4,415,668., Cl. 435-241.000.

Siemens AG: *See—*
Lechner, Robert; and Wintzer, Klaus, 4,415,881., Cl. 340-347.0AD.

Siemens Aktiengesellschaft: *See—*
Birkle, Siegried; Gehring, Johann; and Stoger, Klaus, 4,415,422., Cl. 204-199.000.
Cutter, David; and Unterberger, Hans, 4,415,981., Cl. 364-518.000.
Degenhardt, Heinz, 4,415,471., Cl. 252-301.360.
Glock, Hans, 4,415,995., Cl. 365-190.000.
Kopp, Walter; Mugrauer, Hubert; and Stuerzer, Anton, 4,415,257., Cl. 355-3.0TR.
Kreutzev, Hans; and Mattuschka, Werner, 4,415,826., Cl. 310-354.000.
Mueller, Ruediger, 4,415,816., Cl. 307-265.000.
von Sichart, Frithjof, 4,415,883., Cl. 340-347.0DA.
Wehnelt, Ulrich, 4,414,722., Cl. 29-25.420.

Siemens Corporation: *See—*
Plummer, Steven J.; and Wieloch, James E., 4,416,021., Cl. 378-181.000.

Sievers, Kirk A.; and Santis, Dean C., to Motorola, Inc. Alternator protection system. 4,415,849., Cl. 322-99.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Cavazza, Claudio, 4,415,588., Cl. 424-311.000.
Cavazza, Claudio, 4,415,589., Cl. 424-311.000.

Signetics Corporation: *See—*
Fletcher, Thomas D., 4,415,817., Cl. 307-454.000.

Simmons Universal Corporation: *See—*
Biscoe, Thomas S.; and Taylor, Rodney S., 4,415,147., Cl. 267-111.000.

Simon, Istvan. Two stroke oscillating piston engine. 4,414,927., Cl. 123-62.000.

Simonsson, Berit I.: *See—*
Lundin, Claes O. A.; and Simonsson, Berit I., 4,415,716., Cl. 526-209.000.

Simplex Time Recorder Co.: *See—*
Franke, George, 4,415,801., Cl. 235-101.000.

Simpson, Carroll; and Schierl, Ludwig, to American Hoechst Corporation. Method and apparatus for treating strand-like material. 4,414,756., Cl. 34-23.000.

Singer Company, The: *See—*
Thornbery, James M.; Obermann, George; and Mateja, Edward J., 4,415,784., Cl. 200-35.00R.
Tullman, Edward J., 4,414,907., Cl. 112-158.00B.

Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,415,578., Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, 4,415,580., Cl. 424-263.000.

Singh, Gurdev: *See—*
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969., Cl. 364-200.000.

Sinter Limited: *See—*
Caratsch, Hans P., 4,414,914., Cl. 118-63.000.

Sitko, James R. Suspension strut assembly. 4,415,146., Cl. 267-9.00C.

Skornyakov, Eduard P.: *See—*
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Povhemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.

Slaugh, Lynn H.: *See—*
Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,415,675., Cl. 518-715.000.
Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,415,676., Cl. 518-715.000.

Slough, Carlton M.; and Colling, Edwin L., Jr., to Texaco Inc. Paraffin monitor. 4,415,859., Cl. 324-442.000.

Small, Hamish; and Miller, Theodore E., Jr., to Dow Chemical Company, The. Ion exchange chromatography with indirect photometric detection. 4,414,842., Cl. 73-61.10C.

Smith, Francis S.: *See—*
Capaccio, Giancarlo; Smith, Francis S.; and Ward, Ian M., 4,415,522., Cl. 264-210.800.

Smith, Frederick A. Handicapped-driven sidecar. 4,415,056., Cl. 180-210.000.

Smith, Jon D.; and Parker, Glenn T., to Dry Dock Industries, Inc. Anchoring retainer for threaded fasteners. 4,415,299., Cl. 411-340.000.

Smith, Joseph E., to Gulf & Western Manufacturing Company. Ball and socket joints. 4,415,291., Cl. 403-36.000.

Smith, Michael A., to Baron Data Systems. Shorthand machine having active tactile feedback. 4,415,283., Cl. 400-94.000.

Smith and Nephew Associated Companies Limited: *See—*
Berry, Peter W., 4,414,970., Cl. 128-156.000.

Smith, Philip C.; and Fagan, John L., to United States of America, Air Force. Fast access non-volatile memory. 4,415,993., Cl. 365-184.000.

Smith, Raymond J. D.: *See—*
Davis, Vincent L.; and Smith, Raymond J. D., 4,415,605., Cl. 427-65.000.

Smith, Robert B., to Gas Research Institute. Internal wrapping method and apparatus. 4,415,390., Cl. 156-187.000.

Smith, Sebie B. Bicycle training and exercise device. 4,415,152., Cl. 272-73.000.

Smith, Terrence R.: *See—*
Strolle, Christopher H.; Smith, Terrence R.; and Reitmeier, Glenn A., 4,415,928., Cl. 358-140.000.

Smith-Williams, Margie M.; and Williams, Robert E. Mount for trailer jack. 4,415,182., Cl. 280-763.100.

Smiths Industries Public Limited Company: *See—*
Evans, John M.; and Gilroy, Keith, 4,414,983., Cl. 128-747.000.

Smolin, William, to Texaco Inc. Pyridine-modified Na X-type or Li X-type adsorbent characterized by its ability to separate para-xylene from C-8 aromatic hydrocarbon mixtures. 4,415,481., Cl. 502-62.000.

Snam S.p.A.: *See—*
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,415,185., Cl. 285-114.000.

Socapex: *See—*
Malinge, Jean L.; Soster, Marie C.; and Lamarche, Dominique, 4,415,347., Cl. 65-4.210.

Societa Cavi Pirelli Societa per Azioni: *See—*
Priaroggia, Paolo G.; and Occhini, Elio, 4,415,761., Cl. 174-25.00R.
Priaroggia, Paolo G.; Bianchi, Giuseppe; and Sala, Angelo, 4,415,764., Cl. 174-37.000.

Societe Anonyme dite: Alsthom-Atlantique: *See—*
Messe, Gerard; and Faure, Michel, 4,415,874., Cl. 336-178.000.

Societe Anonyme dite: Institut Merieux: *See—*
Tayot, Jean-Louis, 4,415,733., Cl. 536-53.000.

Societe Anonyme dite: Stein Industrie: *See—*
Nicolas, Jacques; and Lenglet, Paul, 4,414,833., Cl. 72-13.000.

Societe d'Applications des Machines Motrices: *See—*
Devaud, Gerard L., 4,414,881., Cl. 91-216.00R.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See—*
Bouiller, Jean G.; Crozet, Francois E. G.; and Soligny, Marcel R., 4,415,310., Cl. 416-95.000.

Societe Suisse pour l'Industrie Horlogere Management Services SA: *See—*
Zumsteg, Alphonse, 4,415,870., Cl. 331-176.000.

Soclof, Sidney I., to Rockwell International Corporation. Method of making sub-micron dimensioned NPN lateral transistor. 4,415,371., Cl. 148-1.500.

Sodini, Gregory L., to International Telephone and Telegraph Corporation. Starting circuit for gaseous discharge lamps. 4,415,837., Cl. 315-177.000.

Soligny, Marcel R.: *See—*
Bouiller, Jean G.; Crozet, Francois E. G.; and Soligny, Marcel R., 4,415,310., Cl. 416-95.000.

Son, Pyong N.: *See—*
Lai, John T.; and Son, Pyong N., 4,415,684., Cl. 524-92.000.

Sony Corporation: *See—*
Hay, Thomas M., III, 4,415,891., Cl. 340-753.000.
Ive, John G. S.; and Thirlwall, Alan C., 4,415,994., Cl. 365-189.000.

Soster, Marie C.: *See—*
Malinge, Jean L.; Soster, Marie C.; and Lamarche, Dominique, 4,415,347., Cl. 65-4.210.

Southard, Carl: *See—*
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,415,155., Cl. 273-26.00E.

Southerland, Stephen R.: *See—*
Huffman, Charles E.; and Southerland, Stephen R., 4,416,009., Cl. 370-100.000.

Sowerby, Brian D., to Australian Atomic Energy Commission. Annihilation radiation analysis. 4,415,804., Cl. 250-255.000.

Spars, Byron G.; and Santucci, Lawrence E., to Chevron Research Company. Barrier for containing spent oil shale. 4,415,365., Cl. 106-85.000.

Specht, Donald P.; and Thomas, Harold T., to Eastman Kodak Company. Use of α,α-bis(dialkylaminobenzylidene) ketone dyes in optical recording elements. 4,415,621., Cl. 428-172.000.

Spencer, Larry K. Three-way hydraulic controller. 4,414,995., Cl. 137-77.000.

Speros, Dimitri M.: *See—*
Mishra, Amarendra; Speros, Dimitri M.; and Eastin, Roger M., 4,415,835., Cl. 313-627.000.

Sperry Corporation: *See—*
Adcock, Ralph L., 4,415,972., Cl. 364-200.000.
Campbell, Willis R., 4,414,796., Cl. 56-341.000.
Campbell, Willis R.; and Oellig, Franklin A., 4,414,888., Cl. 100-88.000.
Clark, Charles A., Jr., 4,415,960., Cl. 363-21.000.
Halls, Lawrence M., 4,414,793., Cl. 56-14.400.
Swenson, Robert E.; Sasscer, Lawrence D.; and George, Benjamin T., 4,415,970., Cl. 364-200.000.

Spiess, Joachim: *See—*
Vale, Wylie W., Jr.; Spiess, Joachim; Rivier, Catherine L.; and Rivier, Jean E. F., 4,415,558., Cl. 424-177.000.

Spigolon, Silvio J.: *See*—
Wilson, Eddie K., Sr.; and Spigolon, Silvio J., 4,415,543., Cl. 423-178.000.
Sprague, Robert A.; and Flores, Lawrence N., to Xerox Corporation. Multilayer interleaved electrodes for multigate light valves. 4,415,915., Cl. 346-160.000.
Spriggel, Kenneth A.: *See*—
Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., 4,414,843., Cl. 73-66.000.
Square D Company: *See*—
Schwartz, Wesley W., 4,415,957., Cl. 362-297.000.
Staas, William H., to Rohm and Haas Company. Compatible blends of polyglutarimides and polyamides. 4,415,706., Cl. 525-183.000.
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, to Rutgerswerke Aktiengesellschaft. Process for the preparation of highly aromatic pitchlike hydrocarbons. 4,415,429., Cl. 208-8.0LE.
Staehlin, John H., to Westinghouse Electric Corp. Missile system with acceleration induced operational energy. 4,415,130., Cl. 244-3.150.
Staeubli Ltd.: *See*—
Kleiner, Walter, 4,415,007., Cl. 139-329.000.
Stamicarbon B.V.: *See*—
Dorrestijn, Antoon; Lemstra, Pieter J.; and van Unen, Lambert H. T., 4,415,514., Cl. 264-53.000.
Standard Oil Company, The: *See*—
Benton, Kenneth C.; Cmolik, Brian L.; and Weinert, Raymond J., 4,415,474., Cl. 502-117.000.
Chan, Albert F.; and Casteel, Jerry F., 4,415,033., Cl. 166-274.000.
Cordell, Ralph L., 4,415,857., Cl. 324-357.000.
Wiggins, Wayne T., 4,415,406., Cl. 156-668.000.
Wiggins, Wayne T.; and Gerry, Frank S., 4,415,520., Cl. 264-171.000.
Standard Oil Company (Ind.): *See*—
Hargreaves, Jay T.; and Hensley, Albert L., 4,415,434., Cl. 208-11.00R.
Standard Oil Company (Indiana): *See*—
Fields, Ellis K., 4,415,483., Cl. 502-255.000.
Hoekstra, Gerald B., deceased, 4,415,433., Cl. 208-11.00R.
Puskas, Imre; and James, David E., 4,415,479., Cl. 502-85.000.
Stasi, Michael A.; Bowman, Walker H.; and Rader, Edward F., 4,415,336., Cl. 44-13.000.
York, Earl D., 4,415,430., Cl. 208-8.00R.
York, Earl D., 4,415,432., Cl. 208-11.00R.
Stanescu, Mircea-Stefan; and Fitzgerald, William T., to BOC Group, Inc., The. Heat treatment processes. 4,415,379., Cl. 148-16.000.
Stanko, Ronald T., to Montefiore Hospital. Method for preventing body fat deposition in mammals. 4,415,576., Cl. 424-252.000.
Stanley, Frank L., to Bell Telephone Laboratories, Incorporated. Optical fiber switch apparatus. 4,415,228., Cl. 350-96.200.
Stasi, Michael A.; Bowman, Walker H.; and Rader, Edward F., to Standard Oil Company (Indiana). Method and apparatus for continuous pumping of compressible solids against high pressures. 4,415,336., Cl. 44-13.000.
Stastney, Frank. Garment clasping device. 4,414,716., Cl. 24-3.00L.
Statek Corporation: *See*—
Chuang, Shih, 4,415,827., Cl. 310-370.000.
Staton, Eric. Room decoration. 4,414,767., Cl. 40-429.000.
Stauffer Chemical Company: *See*—
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,415,506., Cl. 260-986.000.
Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., 4,415,351., Cl. 71-87.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,352., Cl. 71-88.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,415,353., Cl. 71-100.000.
Robbins, Jeffrey D., 4,415,503., Cl. 260-502.50F.
Tsai, Chung-Chieh, 4,415,469., Cl. 252-182.000.
Stavrov, Leonid P.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.
Stednitz, Denis P., to Ace Orthopedic Manufacturing, Inc. Fixation pin. 4,414,966., Cl. 128-92.00B.
Steele, Ronald, to Development & Finance Limited. Kit for converting a bed into a four-poster. 4,414,727., Cl. 29-401.100.
Steinbrecher, Wolfgang: *See*—
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495., Cl. 260-239.00D.
Stellar Systems, Inc.: *See*—
Mongeon, Ronald W., 4,415,885., Cl. 340-552.000.
Stephenson, Edgar O.; and Brown, Victor R. R., to General Electric Company. High temperature insulated casing. 4,415,184., Cl. 285-47.000.
Sterling Drug Inc.: *See*—
Lesher, George Y.; and Singh, Baldev, 4,415,578., Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, 4,415,580., Cl. 424-263.000.
Yu, Andrew B. C.; and John, Phillip M., 4,415,547., Cl. 424-19.000.
Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Dielectric waveguide circulator. 4,415,871., Cl. 333-1.100.
Stetter, Jorg: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,415,586., Cl. 424-273.00R.
Stevenson, Christopher T. S., to Litton Industrial Products, Inc. Friction welding machine having an expanding mandrel backstop assembly. 4,415,172., Cl. 279-33.000.
Stoger, Klaus: *See*—
Birkle, Siegried; Gehring, Johann; and Stoger, Klaus, 4,415,422., Cl. 204-199.000.
Stone, Robert O.: *See*—
Laug, Owen B.; Gordon, Charles C.; and Stone, Robert O., 4,415,974., Cl. 364-426.000.
Strafello, Nicholas. Offset printing. 4,414,892., Cl. 101-44.000.
Strain, Robert V.: *See*—
Gross, Kenny C.; and Strain, Robert V., 4,415,524., Cl. 376-216.000.
Strassel, Albert, to Produits Chimiques Ugine Kuhlmann. Method of making polyvinylidene fluoride-thermoplastic resin laminates. 4,415,519., Cl. 264-171.000.
Strasser, Robert A.; and Goch, Stephen W., to Ford Motor Company. Container for gas generating propellant. 4,414,902., Cl. 102-531.000.
Strasser, Rudolf: *See*—
Blum, Klaus; and Strasser, Rudolf, 4,415,499., Cl. 260-410.90N.
Strock, William J.: *See*—
Craig, Harold M.; Wagner, Walter B.; and Strock, William J., 4,414,816., Cl. 60-757.000.
Stroessner, Rolf B.: *See*—
Clabburn, Robin J. T.; and Stroessner, Rolf B., 4,415,217., Cl. 339-113.00L.
Strolle, Christopher H.; Smith, Terrence R.; and Reitmeier, Glenn A., to RCA Corporation. Calculation of radial coordinates of polar-coordinate raster scan. 4,415,928., Cl. 358-140.000.
Strong, James J.: *See*—
Finch, Harvey E.; and Strong, James J., 4,415,462., Cl. 210-767.000.
Strong-Robinette Company, Inc.: *See*—
Ferrell, Robert A.; and Robinette, James A., 4,415,386., Cl. 156-64.000.
Strozyk, Rudolf-Helmut: *See*—
Emmenthal, Klaus-Dieter; Schafer, Otto; and Strozyk, Rudolf-Helmut, 4,414,944., Cl. 123-339.000.
Strubhar, Malcolm K.: *See*—
Medlin, William L.; Strubhar, Malcolm K.; and Fitch, John L., 4,415,035., Cl. 166-308.000.
Studiengesellschaft Kohle mbH: *See*—
Demuth, Martin; and Schaffner, Kurt, 4,415,756., Cl. 568-365.000.
Stuerzer, Anton: *See*—
Kopp, Walter; Mugrauer, Hubert; and Stuerzer, Anton, 4,415,257., Cl. 355-3.0TR.
Stytsenko, Valentin D.: *See*—
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,415,477., Cl. 502-178.000.
Suciu, George D.; and Paustian, John E., to Lummus Company, The. Oxidation of organics in aqueous salt solutions. 4,415,460., Cl. 210-754.000.
Suemori, Noboru, to Hitachi, Ltd. Printing pulse control circuit for thermal printing head. 4,415,907., Cl. 346-76.0PH.
Sugawara, Masaaki: *See*—
Naito, Hiroyuki; Maruya, Takashi; and Sugawara, Masaaki, 4,415,364., Cl. 106-74.000.
Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., to Texaco, Inc. Low halide activated agglomerated carbon catalysts. 4,415,478., Cl. 502-181.000.
Sugimoto, Takashi: *See*—
Miyasako, Yoji; Sugimoto, Takashi; and Tanaka, Toru, 4,415,919., Cl. 358-26.000.
Sugimoto, Yoshikazu: *See*—
Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, 4,415,457., Cl. 210-682.000.
Sugita, Yoshimori, to Brother Kogyo Kabushiki Kaisha. Collapsible knitting machine. 4,414,827., Cl. 66-60.00H.
Sugita, Yutaka: *See*—
Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262., Cl. 355-125.000.
Sugiura, Kenitiro, to Canon Kabushiki Kaisha. Thermal printer. 4,415,908., Cl. 346-76.0PH.
Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Jitter compensation system in a rotary recording medium reproducing apparatus. 4,415,936., Cl. 358-322.000.
Sugiyama, Keiichi: *See*—
Matsumoto, Hiromitsu; and Sugiyama, Keiichi, 4,414,953., Cl. 123-571.000.
Sugiyama, Yoshiki: *See*—
Kato, Kunio; Sugiyama, Yoshiki; and Enomoto, Ryo, 4,415,535., Cl. 422-143.000.
Sultanovich, Jury A.: *See*—
Brazhnikov, Vadim V.; Skornyakov, Eduard P.; Sultanovich, Jury A.; Poshemansky, Vladimir M.; Sakodynsky, Karl I.; Berlin, Semen S.; Ogurtsov, Vladimir V.; and Alekhin, Vladimir V., 4,414,857., Cl. 73-863.110.
Sulzer Brothers Limited: *See*—
Herzog, Rudolf, 4,415,966., Cl. 364-162.000.
Schmitz, Gerd, 4,415,010., Cl. 139-439.000.
Sumitomo Metal Mining Company Limited: *See*—
Chiba, Hiroshi; and Ogura, Shoichi, 4,415,917., Cl. 357-70.000.

Sundstrand Corporation: *See*—
Elmberg, Dwayne R., 4,415,782., Cl. 200-6.00A.
Suplinskas, Raymond J.: *See*—
Debolt, Harold E.; Suplinskas, Raymond J.; Cornie, James A.; Henze, Thomas W.; and Hauze, Albert W., 4,415,609., Cl. 427-249.000.
Suzuki, Hiroyuki, to Sharp Kabushiki Kaisha. Both side record player. 4,416,003., Cl. 369-75.200.
Suzuki, Hisashi, to Iseki & Co., Ltd. Process for waste water disposal. 4,415,451., Cl. 210-610.000.
Suzuki, Keizo: *See*—
Takinami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, 4,414,828., Cl. 70-84.000.
Suzuki, Koichi, to Universal Pioneer Corporation. Tangential servo control signal generating device for recorded data reproducing device. 4,415,935., Cl. 358-320.000.
Suzuki, Kunihiko, to Nissan Motor Company, Limited. Four-wheel drive system for a wheeled vehicle. 4,415,058., Cl. 180-247.000.
Suzuki, Kunio: *See*—
Sato, Masayoshi; and Suzuki, Kunio, 4,414,897., Cl. 101-216.000.
Suzuki Motor Company Limited: *See*—
Furukawa, Akira; Araki, Minoru; and Genma, Hideyuki, 4,415,195., Cl. 296-146.000.
Suzuki, Ryoichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Exposure control apparatus. 4,415,248., Cl. 354-43.000.
Suzuki, Suguru; Sano, Noritoshi; and Tajima, Tetsuya, to Eisai Co., Ltd. Anticoagulant. 4,415,559., Cl. 424-183.000.
Suzuki, Susumu: *See*—
Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, 4,416,010., Cl. 371-37.000.
Svab, Eugen, to Ford Motor Company. Planetary gear arrangement for a continuously variable transmission. 4,414,862., Cl. 74-788.000.
Svec, Frantisek: *See*—
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.
Svecia Silkscreen Maskiner AB: *See*—
Ericsson, Sylve J. D., 4,414,755., Cl. 34-4.000.
Swagger, Roy G.: *See*—
McKinney, Joe R.; and Swagger, Roy G., 4,415,378., Cl. 148-12.100.
Swallow, Brian R., to Union Carbide Corporation. Process to separate nitrogen from natural gas. 4,415,345., Cl. 62-28.000.
Swanson, Ronald L.: *See*—
Connell, Michael J.; and Swanson, Ronald L., 4,415,106., Cl. 224-221.000.
Swatton, David W.: *See*—
Munger, Stanley H.; Short, Michael R.; and Swatton, David W., 4,415,649., Cl. 430-271.000.
Swenson, Robert E.; Sasscer, Lawrence D.; and George, Benjamin T., to Sperry Corporation. Cache/disk subsystem with load equalization. 4,415,970., Cl. 364-200.000.
Swift, Stephen J.: *See*—
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979., Cl. 128-419.00F.
Swindal, James L.: *See*—
Grantham, Daniel H.; and Swindal, James L., 4,415,948., Cl. 361-283.000.
Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,415,354., Cl. 71-103.000.
Sybron Corporation: *See*—
Daisley, Richard J.; and Ring, Lawrence S., 4,415,330., Cl. 433-16.000.
Symon, Ted; and Barszcz, Chester F., to UOP Inc. Support matrix for immobilized enzymes. 4,415,663., Cl. 435-176.000.
Symon, Ted: *See*—
Barszcz, Chester F.; and Symon, Ted, 4,415,664., Cl. 435-176.000.
Szalewski, Paul P.: *See*—
Denes, Oscar L.; Kiphart, Lynn R.; and Szalewski, Paul P., 4,415,607., Cl. 427-96.000.
Szoboszlay, Akos I.: *See*—
Bettencourt, Darryl G.; and Szoboszlay, Akos I., 4,414,792., Cl. 56-10.200.
Szonntagh, Eugene L., to Honeywell Inc. Method for operating a gas analyzing system and apparatus utilizing the same. 4,415,278., Cl. 374-37.000.
Tabata, Yukio: *See*—
Kawanishi, Toshiyuki; and Tabata, Yukio, 4,415,903., Cl. 346-1.100.
Tagashira, Minoru: *See*—
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958., Cl. 126-450.000.
Taig, Alistair G., to Bendix Corporation, The. Hydraulic control apparatus. 4,415,002., Cl. 137-625.230.
Taiho Kogyo Co., Ltd.: *See*—
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,415,168., Cl. 277-96.100.
Tajima, Tetsuya: *See*—
Suzuki, Suguru; Sano, Noritoshi; and Tajima, Tetsuya, 4,415,559., Cl. 424-183.000.
Tajima, Yoshio: *See*—
Miyoshi, Mituji; Matsuura, Kazuo; and Tajima, Yoshio, 4,415,718., Cl. 526-348.600.
Takada, Toshiaki; and Hiraiwa, Kazuyoshi, to Nissan Motor Co., Ltd. Apparatus for detecting the neutral position of a manual transmission for motor vehicles. 4,415,786., Cl. 200-61.910.
Takada, Yusaku: *See*—
Inoue, Takahiro; Takada, Yusaku; and Aoki, Takao, 4,415,256., Cl. 355-3.0TR.
Takagi, Shunichi: *See*—
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamota, Takahito, 4,415,828., Cl. 313-118.000.
Takagiwa, Hiroyuki: *See*—
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644., Cl. 430-106.600.
Takahashi, Masahiro; Hamada, Takuji; and Fushimi, Hitoshi, to Hitachi, Ltd. Dual loop type data highway system. 4,416,008., Cl. 370-88.000.
Takahashi, Masayoshi: *See*—
Eguchi, Yasukata; Hanyu, Susumu; Nemoto, Reishi; and Takahashi, Masayoshi, 4,414,908., Cl. 112-169.000.
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Kudo, Hideki, to NGK Spark Plug Co., Ltd. Gas sensing element. 4,415,877., Cl. 338-34.000.
Takanashi, Shigeru: *See*—
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.
Takawashi, Tamio: *See*—
Yamada, Shigeo; Takawashi, Tamio; and Sakakibara, Toshimitsu, 4,415,791., Cl. 219-69.00G.
Takei, Yoshiaki: *See*—
Goto, Satoshi; Sawada, Kiyoshi; Sasaki, Osamu; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,640., Cl. 430-59.000.
Goto, Satoshi; Kinoshita, Akira; Takei, Yoshiaki; and Fujimaki, Yoshihide, 4,415,641., Cl. 430-59.000.
Takematsu, Yoshiyuki, to Fuji Koeki Corporation. Electric flash apparatus. 4,415,247., Cl. 354-33.000.
Takemori, Toshio; Kato, Masateru; and Masuda, Fumio, to Lotte Co., Ltd. Marshmallow frozen confection. 4,415,595., Cl. 426-101.000.
Takenaka, Akira; and Fukuoka, Tatsuhiko, to Taiho Kogyo Co., Ltd. Mechanical seal. 4,415,168., Cl. 277-96.100.
Takeshima, Masaki: *See*—
Shirosaki, Kiyotaka; Sugimoto, Yoshikazu; and Takeshima, Masaki, 4,415,457., Cl. 210-682.000.
Takeuchi, Shigefumi: *See*—
Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, 4,415,933., Cl. 358-281.000.
Takinami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, to Toyota Jidosha Kogyo Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Locking apparatus for compartment door operated by a key. 4,414,828., Cl. 70-84.000.
Takizawa, Kinji, to Mitutoyo Mfg. Co., Ltd. Linear scale type measuring instrument. 4,414,746., Cl. 33-125.00C.
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Electrostatic image developing toner and a method for the production thereof. 4,415,644., Cl. 430-106.600.
Tamukai, Tadao: *See*—
Hori, Fumihisa; Tamukai, Tadao; and Miyajima, Mikio, 4,414,893., Cl. 101-93.150.
Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Color original readout apparatus. 4,415,925., Cl. 358-75.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,415,504., Cl. 260-501.120.
Tanabe, Sohei: *See*—
Nakayama, Masahito; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; and Mori, Toshihito, 4,415,497., Cl. 260-245.20T.
Tanaka, Junzo; Kai, Toshio; and Fujitani, Yoshitomo, to Matsushita Electric Industrial Co., Ltd. Multi-function oven with control circuit for operation during fermentation of yeast containing product. 4,415,799., Cl. 219-400.000.
Tanaka, Kazushi: *See*—
Kubota, Yuichi; Nishimatsu, Masaharu; and Tanaka, Kazushi, 4,415,630., Cl. 428-403.000.
Tanaka, Nobuyoshi: *See*—
Kato, Yuzo; Tanaka, Nobuyoshi; Kawamura, Naoto; Nakatsui, Hisashi; Ishihara, Shunichi; and Sato, Yasushi, 4,415,920., Cl. 358-37.000.
Tanaka, Ryoichi: *See*—
Nishida, Chikashi; Okita, Yoshishiro; Tanaka, Ryoichi; Kajimoto, Takeshi; and Nasu, Hitoo, 4,415,050., Cl. 180-6.480.
Tanaka, Toru: *See*—
Miyasako, Yoji; Sugimoto, Takashi; and Tanaka, Toru, 4,415,919., Cl. 358-26.000.
Tanaka, Toshio: *See*—
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, 4,415,785., Cl. 200-38.00B.
Tang, Donald C. L.: *See*—
Tang, Robin K. L.; and Tang, Donald C. L., 4,415,776., Cl. 179-81.00R.
Tang, Robin K. L.; and Tang, Donald C. L. Telephone music-on-hold device. 4,415,776., Cl. 179-81.00R.
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, to Nippon Kokan Kabushiki Kaisha. Method for forcedly cooling a heated metal plate. 4,415,381., Cl. 148-153.000.
Tanji, Hiroshi; Iwata, Michitaka; and Sato, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyester fiber dyeable under normal

pressure and process for the production thereof. 4,415,726., Cl. 528-272.000.
Tanner, Nathan S.: *See—*
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,416,014., Cl. 373-93.000.
Tanswell, Paul: *See—*
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.
Tao, Lung-jo: *See—*
Collins, Thomas W.; and Tao, Lung-jo, 4,415,987., Cl. 365-12.000.
Tar, Domokis, to Cerberus AG. Radiation detector for a flame alarm. 4,415,806., Cl. 250-339.000.
Tarasenko, Jury A.: *See—*
Pakhomov, Gennady N.; Luste, Anita Y.; Kadnikova, Galina I.; Kolesnik, Analy G.; Lubotskaya, Lidia N.; Playvnietse, Rita M.; Tarasenko, Jury A.; and Konstantinov, deceased; Nikolai A., 4,415,550., Cl. 424-57.000.
Tarr, Walter R.: *See—*
Sanftleben, Keith E.; and Tarr, Walter R., 4,415,363., Cl. 75-229.000.
Taruttis, Arno H.: *See—*
Vogel, Horst; Idler, Horst; and Taruttis, Arno H., 4,415,899., Cl. 343-413.000.
Tatsumi, Susumu: *See—*
Kurotori, Tsuneo; Mochizuki, Manabu; and Tatsumi, Susumu, 4,415,533., Cl. 422-4.000.
Taylor, Jerry F., to Mine Equipment Company. Multiple personnel transporter vehicle for low vein mines. 4,415,051., Cl. 180-65.00R.
Taylor, Mark P.: *See—*
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,415,672., Cl. 501-4.000.
Taylor, Rodney S.: *See—*
Biscoe, Thomas S.; and Taylor, Rodney S., 4,415,147., Cl. 267-111.000.
Taylor, Thomas L.: *See—*
Morgan, R. Dean; Mauldin, Donald M.; and Taylor, Thomas L., 4,414,759., Cl. 36-11.500.
Tayot, Jean-Louis, to Societe Anonyme dite: Institut Merieux. Ganglioside derivatives, their preparation and their application. 4,415,733., Cl. 536-53.000.
Tazaki, Shigemitsu, to Canon Kabushiki Kaisha. Recording apparatus. 4,415,911., Cl. 346-140.00R.
Tazaki, Shigemitsu: *See—*
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, 4,415,886., Cl. 340-618.000.
TDK Electronics Co., Ltd.: *See—*
Kubota, Yuichi; Nishimatsu, Masaharu; and Tanaka, Kazushi, 4,415,630., Cl. 428-403.000.
TechAmerica Group, Inc.: *See—*
de Castro, Aurora F.; and Gupta, Surendra K., 4,415,655., Cl. 435-17.000.
Tektronix, Inc.: *See—*
Palmquist, Steven R.; and Gaiser, Ronald D., 4,415,861., Cl. 328-58.000.
Penney, Bruce J., 4,415,927., Cl. 358-139.000.
Telectronics Pty. Ltd.: *See—*
Church, Victor E., 4,414,978., Cl. 128-419.0PG.
Hirshorn, Michael S.; Money, David K.; Swift, Stephen J.; and Evans, Robert J., 4,414,979., Cl. 128-419.00F.
Telefonaktiebolaget L M Ericsson: *See—*
Gustafsson, Rolf E. O., 4,415,865., Cl. 330-271.000.
Telex Communications, Inc.: *See—*
Daly, William T.; Gelman, Boris; and Sanderson, William R., 4,415,244., Cl. 353-101.000.
Telex Computer Products, Inc.: *See—*
Plachy, Ivo T., 4,415,513., Cl. 264-45.400.
Tenebruso, Jerry C. Wheeled corner members for luggage. 4,415,173., Cl. 280-47.13R.
Terada, Sadatugu: *See—*
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644., Cl. 430-106.600.
Teraoka, Kazuharu. Weight measuring, price computing and packing apparatus. 4,415,048., Cl. 177-5.000.
Terasawa, Koji: *See—*
Kyogoku, Hiroshi; Tazaki, Shigemitsu; Terasawa, Koji; and Okamura, Shigeru, 4,415,886., Cl. 340-618.000.
Terrell, Jamie B.: *See—*
Pratt, Donna K.; and Terrell, Jamie B., 4,415,029., Cl. 166-212.000.
Teske, Lothar. Device for emptying a round bulk-material silo. 4,415,102., Cl. 222-411.000.
Tetras S.A.: *See—*
Hoffman, Lionel B., 4,415,263., Cl. 355-3.0SH.
Texaco Inc.: *See—*
Canup, Robert E., 4,414,954., Cl. 123-606.000.
Kaufman, Benjamin J., 4,415,740., Cl. 549-273.000.
Larkin, John M., 4,415,755., Cl. 564-480.000.
Nieh, Edward C. Y., 4,415,717., Cl. 526-287.000.
Slough, Carlton M.; and Colling, Edwin L., Jr., 4,415,859., Cl. 324-442.000.
Smolin, William, 4,415,481., Cl. 502-62.000.
Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., 4,415,478., Cl. 502-181.000.
Texas Instruments Incorporated: *See—*
Lachmann, Leonard P.; and Garza, Cesario S., Jr., 4,415,983., Cl. 364-708.000.
Scott, Warner C., 4,415,880., Cl. 382-27.000.
Thim, Stig, to A. Betong AB. Device for sleepers for railway tracks. 4,415,120., Cl. 238-8.000.
Thirlwall, Alan C.: *See—*
Ive, John G. S.; and Thirlwall, Alan C., 4,415,994., Cl. 365-189.000.
Thirumalachar, Mandayam J.; and Narasimhan, Mandayam J., Jr. Microbial degradation of petroleum materials. 4,415,661., Cl. 435-174.000.
Thirumalachar, Mandayam J.; and Narasimhan, Mandayam J., Jr. Microbial degradation of petroleum materials. 4,415,662., Cl. 435-176.000.
Thomas & Betts Corporation: *See—*
Narozny, Ronald S., 4,415,216., Cl. 339-107.000.
Thomas, Harold T.: *See—*
Specht, Donald P.; and Thomas, Harold T., 4,415,621., Cl. 428-172.000.
Thomas, Michael D.: *See—*
Ryder, Francis E.; and Thomas, Michael D., 4,414,975., Cl. 128-314.000.
Thompson, Edwin G.: *See—*
Bayless, John R.; Hargrove, Homer G.; and Thompson, Edwin G., 4,415,021., Cl. 165-76.000.
Thompson, Martin K.: *See—*
Nield, Eric; and Thompson, Martin K., 4,415,699., Cl. 524-538.000.
Thompson, Paul W.: *See—*
Huizinga, Donald D.; and Thompson, Paul W., 4,416,007., Cl. 370-62.000.
Thomson-CSF: *See—*
Reymond, Jean C.; and Gontier, Maurice, 4,415,922., Cl. 358-22.000.
Thornbery, James M.; Obermann, George; and Mateja, Edward J., to Singer Company, The. Timer with delayed start capability. 4,415,784., Cl. 200-35.00R.
Thornton, Jack C.; and Russell, Randy G., to Rockwell International Corporation. Variable inductor having reduced arcing tendency. 4,415,873., Cl. 336-139.000.
Thornton, James O.: *See—*
Allmendinger, James M.; and Thornton, James O., 4,415,369., Cl. 134-22.120.
Thorp, James B. Door locking mechanism. 4,415,191., Cl. 292-346.000.
Thorsett, Eugene D.: *See—*
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvratt, Matthew J., Jr., 4,415,496., Cl. 260-239.30B.
Thorsteinson, Erlind M.: *See—*
Decker, Harry J.; and Thorsteinson, Erlind M., 4,415,752., Cl. 562-534.000.
Throner, Guy C., to Battelle Memorial Institute. Gas regulated compensating valve mechanism for firearms. 4,414,880., Cl. 89-193.000.
Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lenke, Dieter; Lehmann, Hans D.; and Gries, Josef, to BASF Aktiengesellschaft. Carbamate dihydropyridazinones, their preparation and therapeutic agents containing these compounds. 4,415,571., Cl. 424-250.000.
Tideland Signal Corporation: *See—*
Recane, Marion L.; Burns, William V.; McMillen, Charles E.; and Luce, Dan G., 4,415,951., Cl. 362-20.000.
Tiefel, Thomas H.: *See—*
Jin, Sungho; and Tiefel, Thomas H., 4,415,380., Cl. 148-101.000.
Tiemens, Ulf: *See—*
Curth, Claus P.; Tiemens, Ulf; and Klotz, Erhard, 4,416,018., Cl. 378-2.000.
Tiger, Ronald L.: *See—*
Kammeraad, James A.; and Tiger, Ronald L., 4,414,723., Cl. 29-26.00A.
TII Industries, Inc.: *See—*
Wortman, Donald W., 4,415,943., Cl. 361-22.000.
Timberlake, John F.; Baugh, Daniel W., Jr.; and Burkes, Bobby, to Dow Chemical Co., The. Polycarbonate type nonionic surfactants. 4,415,502., Cl. 260-463.000.
Timex Corporation: *See—*
Capolupo, David F., 4,414,719., Cl. 24-265.0WS.
Kostanecki, Andrew T.; and Mileos, George, 4,414,714., Cl. 24-265.0WS.
Timms, Donny L., to Manville Service Corporation. Method and apparatus for shaping fiber mats. 4,415,517., Cl. 264-118.000.
Ting Enterprises, Inc.: *See—*
Evans, Jeffrey L., 4,414,957., Cl. 126-121.000.
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, to Daicel Chemical Industries, Ltd. Aqueous dispersion of a cellulose derivative. 4,415,703., Cl. 525-54.210.
Tobin, Mary S., to United States of America, Navy. Distributed feedback laser employing the stark effect. 4,416,013., Cl. 372-96.000.
Toga, Yuzo; Shimada, Toshio; and Okamoto, Ichiro, to Daicel Chemical Industries, Ltd. Modified polyethylene terephthalate molding material. 4,415,727., Cl. 528-272.000.
Tokai Electric Wire Company Limited: *See—*
Inoue, Nori; and Katsuki, Shogo, 4,415,221., Cl. 339-258.00F.
Tokuda, Ryuji: *See—*
Tsuzuki, Hiroyoshi; and Tokuda, Ryuji, 4,415,249., Cl. 354-173.000.
Tokumo, Akio, to Pioneer Electronic Corporation. Pulse width modulation amplifier. 4,415,863., Cl. 330-10.000.
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, to Toyo Stauffer Chemical Co., Ltd. High activity supported cata-

lytic components and method for homo- or co-polymerization of α-olefin. 4,415,713., Cl. 526-125.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Aiba, Toshiyuki, 4,415,822., Cl. 310-59.000.
Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372., Cl. 148-1.500.
Menjo, Atsuhiko; and Saitoh, Shinji, 4,414,737., Cl. 29-578.000.
Miyasako, Yoji; Sugimoto, Takashi; and Tanaka, Toru, 4,415,919., Cl. 358-26.000.
Nishikawa, Mineki, 4,415,982., Cl. 364-527.000.
Ohmura, Hideo; and Horino, Shigeo, 4,414,730., Cl. 29-426.300.
Tomas, Pantcho, to British Gas Corporation. Iron based alloy. 4,415,361., Cl. 75-124.000.
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Piperazinylcarbostyril compounds. 4,415,572., Cl. 424-250.000.
Tomioka, Hiroyuki: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, 4,415,529., Cl. 420-434.000.
Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, to Toyoda Koki Kabushiki Kaisha. Machine tool with automatic tool change function. 4,414,732., Cl. 29-568.000.
Top Shelf Company, Inc.: *See—*
Fair, Rickey F.; and Wilcox, John R., 4,414,959., Cl. 126-332.000.
Toray Industries, Inc.: *See—*
Nakayama, Takashi; Yamagata, Seiichi; and Kajita, Koji, 4,414,800., Cl. 57-236.000.
Yamagata, Seiichi; and Sakai, Masaaki, 4,415,611., Cl. 428-15.000.
Torobin, Leonard B. Method and apparatus for producing hollow metal microspheres and microspheroids. 4,415,512., Cl. 264-9.000.
Tower, Clark B.: *See—*
Kiczek, Alexander P.; Salmen, Leo A.; and Tower, Clark B., 4,415,489., Cl. 252-558.000.
Toyo Jozo Kabushiki Kaisha: *See—*
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,415,730., Cl. 536-7.100.
Toyo Seikan Kaisha, Ltd.: *See—*
Ohmi, Hidehiko, 4,415,096., Cl. 215-343.000.
Toyo Stauffer Chemical Co., Ltd.: *See—*
Tokunaga, Shoichi; Kato, Atsumi; Kimoto, Tatsuo; and Baba, Keikichi, 4,415,713., Cl. 526-125.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Tomita, Tamaki; Sano, Yoshikazu; and Nakashima, Kunimichi, 4,414,732., Cl. 29-568.000.
Toyooka, Yasuo; Ohnishi, Kunio; Ida, Kozo; and Ego, Toyokazu, to Mitsubishi Rayon Company, Ltd. Acrylic laminated diffuser panel having high light-diffusing property and process for preparing same. 4,415,509., Cl. 264-1.300.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Itoh, Hiroshi; and Watanabe, Haruo, 4,414,942., Cl. 123-339.000.
Nagase, Masaomi, 4,414,943., Cl. 123-339.000.
Nakanishi, Tatsuaki, 4,414,941., Cl. 123-326.000.
Ueda, Masahiro; and Noba, Masahiko, 4,414,937., Cl. 123-198.00D.
Toyota Jidosha Kogyo Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Takinami, Toshikazu; Horaguchi, Masao; and Suzuki, Keizo, 4,414,828., Cl. 70-84.000.
Tracy, Gerald T.: *See—*
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.
Trane Company, The: *See—*
Butterworth, Arthur L., 4,415,317., Cl. 418-55.000.
Butterworth, Arthur L.; and Eber, David H., 4,415,318., Cl. 418-55.000.
Tremblay, Meude, to Canada, Her Majesty the Queen in right of. ε-Caprolactone co-polyesters useful for the preparation of polyurethane. 4,415,728., Cl. 528-279.000.
Trenka, Herb M.: *See—*
Dotson, Robert S.; Richeson, W. George; and Trenka, Herb M., 4,414,974., Cl. 128-305.000.
Tressler, Richard E.: *See—*
Monkowski, Joseph R.; and Tressler, Richard E., 4,415,545., Cl. 423-348.000.
Trico Products, Incorporated: *See—*
Goudreau, Noel; Colevris, Nick; and Southard, Carl, 4,415,155., Cl. 273-26.00E.
Tripoli, Antonino; Baldi, Bruno; and Piacentini, Bruno, to Seienia, Industrie Elettroniche Associate, S.p.A. System for floatingly supporting a load. 4,415,304., Cl. 414-589.000.
Tristram, Edward W.: *See—*
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvratt, Matthew J., Jr., 4,415,496., Cl. 260-239.30B.
Tritec Industries, Inc.: *See—*
Durkan, Gerald, 4,414,982., Cl. 128-716.000.
Trocciola, John C.: *See—*
Vine, Raymond W.; Trocciola, John C.; and Setzer, Herbert J., 4,415,537., Cl. 422-180.000.
Trout, David H., to White Consolidated Industries, Inc. Chuck force modulator system for rotary type machine tool. 4,414,871., Cl. 82-40.00R.
Trustee for David Roth: *See—*
D'Elia, Conrad A., 4,415,617., Cl. 428-86.000.
TRW Inc.: *See—*
Drutchas, Gilbert H., 4,415,054., Cl. 180-79.100.
Trzyna, William A.: *See—*
Kulka, Raymond J.; and Trzyna, William A., 4,415,842., Cl. 315-411.000.
Tsai, Chung-Chieh, to Stauffer Chemical Company. Phase stable compositions containing a paraffinic polyol and an isocyanate reactive prepolymer. 4,415,469., Cl. 252-182.000.
Tsang, Wen-Ghih; and Slaugh, Lynn H., to Shell Oil Company. Syngas conversion process. 4,415,675., Cl. 518-715.000.
Tsang, Wen-Ghih; and Slaugh, Lynn H., to Shell Oil Company. Syngas conversion process. 4,415,676., Cl. 518-715.000.
Tschechoslowakische Academie der Wissenschaften: *See—*
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.
Tsubuku, Mitsuro; and Yoshihiro, Tadanobu, to Fuji Electric Co., Ltd. Handling apparatus. 4,415,305., Cl. 414-753.000.
Tsukioka, Kazumi: *See—*
Murayama, Tomio; Miyao, Fumio; Takeuchi, Shigefumi; and Tsukioka, Kazumi, 4,415,933., Cl. 358-281.000.
Tsumita, Norikazu: *See—*
Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262., Cl. 355-125.000.
Tsuruma, Yumiko: *See—*
Ochi, Kiyoshige; Miyamoto, Katsuhito; Mitsui, Hiroki; Tsuruma, Yumiko; Matsunaga, Isao; Matsuno, Takashi; Takanashi, Shigeru; and Shindo, Minoru, 4,415,573., Cl. 424-251.000.
Tsuyoshi Masumoto: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, 4,415,529., Cl. 420-434.000.
Tsuzuki, Hiroyoshi; and Tokuda, Ryuji, to Canon Kabushiki Kaisha. Motor drive circuit for camera. 4,415,249., Cl. 354-173.000.
Tucker, Raymond W.: *See—*
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.
Tullman, Edward J., to Singer Company, The. Buttonhole width adjusting mechanism. 4,414,907., Cl. 112-158.00B.
Turbard, Alan M.; and Foley, Peter N., to Borg-Warner Ltd. Environmental control system. 4,414,818., Cl. 62-176.100.
Turner, Robert L. Subscriber telephone test set. 4,415,778., Cl. 179-175.10R.
Turpin, Charles H.: *See—*
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.
Turpin, Eugene W. Bead breaking tool. 4,415,014., Cl. 157-1.280.
Turre, Gilles H. J.; Hours, Michel; and Labrude, Jacques R. Gel electrophoresis device and method. 4,415,418., Cl. 204-180.00G.
Tyler, Derek E.: *See—*
Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,415,017., Cl. 164-453.000.
Tyler Refrigeration Corporation: *See—*
Ibrahim, Fayez F., 4,414,822., Cl. 62-256.000.
U.S.D. Corp.: *See—*
Matheson, James N.; and Lowry, Philip L., 4,414,973., Cl. 128-206.150.
Uberall, Herbert: *See—*
Gaunaurd, Guillermo C.; and Uberall, Herbert, 4,415,898., Cl. 343-5.0SA.
Uchida, Manabu: *See—*
Yabune, Hideo; and Uchida, Manabu, 4,415,734., Cl. 536-76.000.
Uchino, Hideo: *See—*
Hozumi, Shiro; Aso, Shin'ichi; Tagashira, Minoru; Ebisu, Kouji; and Uchino, Hideo, 4,414,958., Cl. 126-450.000.
Uchiyama, Takashi: *See—*
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,415,248., Cl. 354-43.000.
Ueda, Masahiro; and Noba, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic engine stop and start apparatus. 4,414,937., Cl. 123-198.00D.
Ugari, Takenori; and Yano, Yoichi, to Sanyo Electric Co., Inc. Distortion reducing circuit in FM receiver. 4,416,024., Cl. 455-303.000.
Uhrig, Heinz: *See—*
Schlafer, Ludwig; and Uhrig, Heinz, 4,415,333., Cl. 8-524.000.
Umeda, Soei. Rotary internal combustion engine. 4,414,938., Cl. 123-229.000.
Umezaki, Hiroshi: *See—*
Koyama, Naoki; Maruyama, Youji; Umezaki, Hiroshi; Tsumita, Norikazu; and Sugita, Yutaka, 4,415,262., Cl. 355-125.000.
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, to Kanegafuchi Chemical Industry Company, Limited. Process for preparation of an optically active monoalkyl ester of β-(S)-aminoglutaric acid. 4,415,657., Cl. 435-106.000.
Ungarean, Gary L.: *See—*
Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832., Cl. 72-8.000.
Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,415,017., Cl. 164-453.000.
Unger, Hans-Georg, to Licentia Patent-Verwaltungs-GmbH. Transition between two single mode optical waveguides. 4,415,227., Cl. 350-96.150.

Union Carbide Canada Limited: *See—*
Ross, John W.; and Raty, Pertti T., 4,415,795., Cl. 219-121.0PH.
Union Carbide Corporation: *See—*
Barnabeo, Austin E.; and Keogh, Michael J., 4,415,710., Cl. 525-370.000.
Decker, Harry J.; and Thorsteinson, Erlind M., 4,415,752., Cl. 562-534.000.
Fan, You-Ling, 4,415,698., Cl. 524-521.000.
Jones, David N., 4,415,711., Cl. 526-88.000.
Kaplan, Leonard, 4,415,747., Cl. 560-112.000.
Swallow, Brian R., 4,415,345., Cl. 62-28.000.
United Kingdom Atomic Energy Authority: *See—*
Brown, Michael H.; and Martin, Roger, 4,414,849., Cl. 73-290.00V.
United States of America
Agriculture: *See—*
Boyles, David A.; Gaines, Jack R.; and Haissig, Bruce E., 4,415,350., Cl. 71-77.000.
Air Force: *See—*
Shirk, Michael H., 4,415,132., Cl. 244-48.000.
Smith, Philip C.; and Fagan, John L., 4,415,993., Cl. 365-184.000.
Army: *See—*
Ashley, James R.; Barley, Thomas A.; and Rast, Gustaf J., Jr., 4,415,852., Cl. 324-57.00N.
Durenec, Peter, 4,414,824., Cl. 62-295.000.
Stern, Richard A.; and Babbitt, Richard W., 4,415,871., Cl. 333-1.100.
Wysor, Michael S., 4,415,565., Cl. 424-245.000.
Health and Human Services: *See—*
Friauf, Walter S.; Brooks, Rodney A.; Cascio, Horace E.; and Sank, Victor, 4,415,807., Cl. 250-363.00S.
National Aeronautics and Space Administration: *See—*
Craig, Harold M.; Wagner, Walter B.; and Strock, William J., 4,414,816., Cl. 60-757.000.
Grana, David C.; and Inge, Spencer V., Jr., 4,415,311., Cl. 416-117.000.
Phillips, William H., 4,415,133., Cl. 244-53.00R.
Wolverton, Billy C., 4,415,450., Cl. 210-602.000.
Navy: *See—*
Chu, Wesley W.; and Hibbits, David G., 4,415,991., Cl. 365-77.000.
Gaunaurd, Guillermo C.; and Uberall, Herbert, 4,415,898., Cl. 343-5.0SA.
Jelks, Edward C.; Kerber, George L.; and Wilcox, Howard A., 4,414,738., Cl. 29-579.000.
Kaloi, Cyril M., 4,415,900., Cl. 343-700.0MS.
Laug, Owen B.; Gordon, Charles C.; and Stone, Robert O., 4,415,974., Cl. 364-426.000.
Martini, Leonard J., 4,415,165., Cl. 277-27.000.
Maynard, Julian D.; and Williams, Earl G., 4,415,996., Cl. 367-8.000.
Rubin, David, 4,415,867., Cl. 330-287.000.
Tobin, Mary S., 4,416,013., Cl. 372-96.000.
United States: *See—*
Redlich, Robert W., 4,415,902., Cl. 343-844.000.
U.S. Philips Corporation: *See—*
Becker, Gerhard, 4,415,940., Cl. 360-99.000.
Boeke, Wouter M., 4,415,864., Cl. 330-253.000.
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., 4,415,486., Cl. 252-514.000.
Braat, Josephus J. M.; Haisma, Jan; and Prast, Gijsbert, 4,415,238., Cl. 350-432.000.
Curth, Claus P.; Tiemens, Ulf; and Klotz, Erhard, 4,416,018., Cl. 378-2.000.
Dijkmans, Eise C.; and van de Plassche, Rudy J., 4,415,815., Cl. 307-243.000.
Duijkers, Peter A., 4,415,869., Cl. 331-111.000.
Eisemann, Kurt, 4,415,069., Cl. 188-82.840.
Houkes, Henk, 4,415,838., Cl. 315-248.000.
Kemkers, Pieter, 4,415,083., Cl. 206-334.000.
Mathes, Egon, 4,415,819., Cl. 307-481.000.
Nijman, Aloysius J.; and Schoo?s, Franciscus A. C. M., 4,415,775., Cl. 179-78.00R.
Weiss, Hermann; Linde, Rolf; Mauser, Wilfried; and Klotz, Erhard, 4,416,019., Cl. 378-2.000.
United States Steel Corporation: *See—*
Schacht, Charles A., 4,415,425., Cl. 204-279.000.
Vine, Fred B., 4,415,013., Cl. 152-367.000.
United States Surgical Corporation: *See—*
Green, David T., 4,415,112., Cl. 227-19.000.
United Technologies Corporation: *See—*
Agrawal, Giridhari L., 4,415,280., Cl. 384-103.000.
Agrawal, Giridhari L., 4,415,281., Cl. 384-103.000.
Bourdeau, Romeo G., 4,415,511., Cl. 264-8.000.
Fortmann, William E., 4,415,307., Cl. 415-12.000.
Grantham, Daniel H.; and Swindal, James L., 4,415,948., Cl. 361-283.000.
Kerr, Walter B., 4,414,807., Cl. 60-204.000.
Setzer, Herbert J.; Lesieur, Roger R.; and Karavolis, Sam, 4,415,484., Cl. 502-332.000.
Vine, Raymond W.; Trocciola, John C.; and Setzer, Herbert J., 4,415,537., Cl. 422-180.000.
Unitika Ltd.: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; and Tomioka, Hiroyuki, 4,415,529., Cl. 420-434.000.
Universal Data Systems, Inc.: *See—*
Driver, R. Byron, 4,415,774., Cl. 179-2.0DP.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG: *See—*
Schimko, Reinhold, 4,414,806., Cl. 66-75.200.
Universal Pioneer Corporation: *See—*
Suzuki, Koichi, 4,415,935., Cl. 358-320.000.
University of Alberta, The Governors of The: *See—*
Diener, Erwin; and Diner, Uriel, 4,415,552., Cl. 424-91.000.
University of California, The Regents of the: *See—*
Hull, Maury L.; and Dorius, Lee, 4,415,176., Cl. 280-612.000.
Vyas, Girish N., 4,415,491., Cl. 260-112.50R.
University of Florida: *See—*
Diaz, Nils J.; and Dugan, Edward T., 4,415,525., Cl. 376-317.000.
University of Illinois Foundation: *See—*
Joyce, Cathy L.; and Zaneveld, Lourens J. D., 4,415,585., Cl. 424-273.00P.
University of Virginia, The: *See—*
Wilsdorf, Doris; Wilsdorf, Heinz G. F.; and Adkins, Charles M., III, 4,415,635., Cl. 428-611.000.
University Patents, Inc.: *See—*
Caruthers, Marvin H.; and Beaucage, Serge L., 4,415,732., Cl. 536-27.000.
Uno, Kuniaki; Katumata, Saichi; Tanaka, Toshio; and Omata, Hiroshi, to Kabushiki Kaisha Higashifuji Seisakusho. Timer switch. 4,415,785., Cl. 200-38.00B.
Unrine, Jerome: *See—*
Bentley, Joseph J.; Brown, Thomas E.; and Unrine, Jerome, 4,414,917., Cl. 118-695.000.
Unterberger, Hans: *See—*
Cutter, David; and Unterberger, Hans, 4,415,981., Cl. 364-518.000.
UOP Inc.: *See—*
Barszcz, Chester F.; and Symon, Ted, 4,415,664., Cl. 435-176.000.
Epperson, Bonnie J.; Burnett, Lowell J.; and Helm, Verne D., 4,415,608., Cl. 427-244.000.
Klepa, Peter P., 4,414,996., Cl. 137-101.270.
Rohrbach, Ronald P.; and Maliarik, Mary J., 4,415,656., Cl. 435-96.000.
Symon, Ted; and Barszcz, Chester F., 4,415,663., Cl. 435-176.000.
Wagner, Walter R., 4,415,396., Cl. 156-425.000.
Upjohn Company, The: *See—*
Chen, Augustin T.; Nelb, Robert G., II; and Onder, Kemal, 4,415,693., Cl. 524-198.000.
Hester, Jackson B., Jr., 4,415,583., Cl. 424-269.000.
Ushirokawa, Masahiro; Iwahama, Takeshi; and Senda, Kenichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Water-impermeable polyolefin foam and process for preparing the same. 4,415,680., Cl. 521-56.000.
Uskokovic, Milan R.; and Wovkulich, Peter M., to Hoffmann-La Roche Inc. Tetrahydro-5-(1-hydroxyethyl)-2-hydroxy-N(1-arylhydrocarbyl)furan-4-carbamic acid alkyl esters. 4,415,742., Cl. 549-475.000.
USS Engineers and Consultants, Inc.: *See—*
Shapland, Earl P.; and King, Patrick D., 4,415,103., Cl. 222-590.000.
Ustav Pro Vyzkum Motorovych Vozidel: *See—*
Jahoda, Stanislav, 4,414,939., Cl. 123-274.000.
Utsch, Francis V.; de la Burde, Roger Z.; Aument, Patrick E.; and Merritt, Henry B., to Philip Morris Incorporated. Process for increasing the filling power of tobacco lamina filler. 4,414,987., Cl. 131-296.000.
Vale, Wylie W., Jr.; Spiess, Joachim; Rivier, Catherine L.; and Rivier, Jean E. F., to Salk Institute for Biological Studies, The. CRF And analogs. 4,415,558., Cl. 424-177.000.
Valiot, Catherine; Lemaire, Francis; and Gaussens, Gilbert, to Commissariat a l'Energie Atomique. Process for painting which can be used for marking roads. 4,415,603., Cl. 427-54.100.
Valle, Louis G.: *See—*
Jacobson, Jeff A.; and Valle, Louis G., 4,414,997., Cl. 137-151.000.
Van Brocklin, Lester P.: *See—*
Carron, Mark S.; La Barbera, Ronald S.; Van Brocklin, Lester P.; and Jain, Pawan K., 4,415,506., Cl. 260-986.000.
Vandegrift, George F.; Krumpelt, Michael; and Horwitz, E. Philip. Production of anhydrous aluminum chloride composition and process for electrolysis thereof. 4,415,412., Cl. 204-67.000.
Van den Boom, Johannes: *See—*
Mair, Christian; Van den Boom, Johannes; and Holierweger, Heinz, 4,415,148., Cl. 267-122.000.
van den Hul, Aalt-Jouk. Stylus for tracking a stereophonic or quadraphonic sound groove. 4,416,005., Cl. 369-173.000.
van de Plassche, Rudy J.: *See—*
Dijkmans, Eise C.; and van de Plassche, Rudy J., 4,415,815., Cl. 307-243.000.
van der Kruijs, Franciscus N. G. R.: *See—*
Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., 4,415,486., Cl. 252-514.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.W. Soil cultivating implements. 4,415,039., Cl. 172-47.000.
van der Lely, Cornelis. Monitoring device for machine parts. 4,415,888., Cl. 340-684.000.
Vandervaart, Gerry, to Kool-Fire Limited. Heat exchanger housing with air deflecting baffle and hinge door. 4,415,023., Cl. 165-122.000.
Van Egmond, Henry T.: *See—*
Anjos, Theodore R.; Fay, Robert F.; Sebald, Robert H.; and Van Egmond, Henry T., 4,414,715., Cl. 24-283.000.
Van Hattem, Arie; Prommel, Johan A.; and Roes, Augustinus W. M., to Shell Oil Company. Process for the agglomeration of solids. 4,415,445., Cl. 209-5.000.

van Iterson, Han R.: *See*—
Beuse, Robert H. J.; van Iterson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., 4,415,279., Cl. 374-204.000.

van Unen, Lambert H. T.: *See*—
Dorrestijn, Antoon; Lemstra, Pieter J.; and van Unen, Lambert H. T., 4,415,514., Cl. 264-53.000.

Variable Speech Control Company ("VSC"), The: *See*—
Eppler, William G., Jr.; Klasco, Michael A.; Kornfeld, Irwin H.; and Nathanson, Rex, 4,415,772., Cl. 369-60.000.

Vasiliev, Alexei V.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,415,538., Cl. 422-224.000.

Vass, Eric: *See*—
Heinis, Robert P.; and Vass, Eric, 4,415,270., Cl. 366-216.000.

VAT Aktiengesellschaft fur Vakuum-Apparate-Technik: *See*—
Frei, Willi, 4,414,882., Cl. 91-442.000.

Vaya, Jacob: *See*—
Anathasubramanian, Lakshminarayan; Kelly, T. Ross; and Vaya, Jacob, 4,415,498., Cl. 260-351.100.

Veber, Andre, to Occidental Research Corporation. Method of concentrating alkali metal hydroxide in a cascade of hybrid cells. 4,415,413., Cl. 204-98.000.

Verber, Carl M.; and Kenan, Richard P., to Battelle Memorial Institute. Apparatus for controlling light in electrooptic waveguides with individually addressable electrodes. 4,415,226., Cl. 350-96.140.

Vesley, George F.: *See*—
Esmay, Donald L.; Johnson, Gordon G.; and Vesley, George F., 4,415,615., Cl. 428-40.000.

Vicor Corporation: *See*—
Vinciarelli, Patrizio, 4,415,959., Cl. 363-21.000.

Victor Company of Japan, Ltd.: *See*—
Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, 4,416,010., Cl. 371-37.000.
Saito, Takashi; and Kumaki, Takashi, 4,416,004., Cl. 369-77.200.
Sugiyama, Hiroyuki, 4,415,936., Cl. 358-322.000.

Victor United, Inc.: *See*—
Meyer, Leonard S., 4,415,061., Cl. 182-92.000.

Victorovich, Grigori S.; and Bell, Malcolm C., to Inco Limited. Process for autogenous oxygen smelting of sulfide materials containing base metals. 4,415,356., Cl. 75-21.000.

Vincent, Donald P., to Buehler Ltd. Coolant system for rotating blade cutter. 4,414,783., Cl. 51-267.000.

Vinciarelli, Patrizio, to Vicor Corporation. Forward converter switching at zero current. 4,415,959., Cl. 363-21.000.

Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, to Nuovo Pignone S.p.A.; and Snam S.p.A. Flexible metal coupling for joining underwater pipes laid at great depth. 4,415,185., Cl. 285-114.000.

Vine, Fred B., to United States Steel Corporation. Repair for the tire separations. 4,415,013., Cl. 152-367.000.

Vine, Raymond W.; Trocciola, John C.; and Setzer, Herbert J., to United Technologies Corporation. Catalytic combustor. 4,415,537., Cl. 422-180.000.

Vogel, Horst; Idler, Horst; and Taruttis, Arno H., to International Standard Electric Corporation. Monitor for an instrument-landing system. 4,415,899., Cl. 343-413.000.

Vogl, Norbert M.; Gaulke, Ronald R.; and Harkness, Joseph R., to Briggs & Stratton Corporation. Reciprocating piston-type internal combustion engine with improved balancing system. 4,414,934., Cl. 123-192.00B.

Voigt, Carl; Kleinschmit, Peter; and Manner, Reinhard, to Degussa Aktiengesellschaft. Process for the internal coating of contact tubes. 4,415,485., Cl. 502-100.000.

Voigt, Werner, to Messerschmitt-Boelkow-Blohm GmbH. Freight lashing and locking mechanism. 4,415,298., Cl. 410-69.000.

Volivà, Elmer A. Mixing valve for dual fuel carburetor and method of dual charge mixing performed thereby. 4,415,507., Cl. 261-18.00B.

Volk, Heinrich; and Papenfahs, Theodor, to Hoechst Aktiengesellschaft. Process for separation of 2-hydroxynapthalene-3-carboxylic acid from the reaction mixtures of alkali metal salts of 2-hydroxynaphthalene and carbon dioxide. 4,415,750., Cl. 562-467.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Emmenthal, Klaus-Dieter; Schafer, Otto; and Strozyk, Rudolf-Helmut, 4,414,944., Cl. 123-339.000.

von Loewis of Menar, Axel, to Herner Glas Bernd Hoffbauer. Decorative hollow vitreous article and method of making same. 4,415,614., Cl. 428-38.000.

von Sichart, Frithjof, to Siemens Aktiengesellschaft. Circuit arrangement for converting digital signals in particular PCM signals, into corresponding analog signals with a R-2R chain network. 4,415,883., Cl. 340-347.0DA.

Votan: *See*—
Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767., Cl. 381-45.000.

Vought Corporation: *See*—
Copeland, Robert J.; and Martin, John D., 4,415,759., Cl. 136-246.000.

Vyas, Girish N., to University of California, The Regents of the. Synthetic vaccine peptide epitomes of hepatitis B surface antigen. 4,415,491., Cl. 260-112.50R.

W. H. Brady Co.: *See*—
Barbieri, Joseph C., 4,415,006., Cl. 138-115.000.
Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,415,781., Cl. 200-5.00A.

W. R. Grace & Co.: *See*—
Chiang, Robert L., 4,415,439., Cl. 208-120.000.

Wacker-Chemie GmbH: *See*—
Blum, Klaus; and Strasser, Rudolf, 4,415,499., Cl. 260-410.90N.

Wada, Minoru: *See*—
Kido, Keishiro; Wada, Minoru; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,415,650., Cl. 430-273.000.

Wada, Tsuneo: *See*—
Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; Wada, Tsuneo; Matsubara, Akitoshi; and Takagiwa, Hiroyuki, 4,415,644., Cl. 430-106.600.

Wagner, Bernd: *See*—
Satzinger, Gerhard; Herrmann, Manfred; Fritschi, Edgar; Bahrmann, Heinrich; Ganser, Volker; Wagner, Bernd; and Steinbrecher, Wolfgang, 4,415,495., Cl. 260-239.00D.

Wagner, James C.; Barnard, James E.; and Woerner, Robert J., to Material Control, Inc. Size sensing X-ray cassette tray for X-ray equipment. 4,416,020., Cl. 378-181.000.

Wagner, Lawrence F.: *See*—
Gill, Stephen P.; Wagner, Lawrence F.; Frye, Gregory G.; and Bantowsky, Klaus-Peter A., 4,415,767., Cl. 381-45.000.

Wagner, Walter B.: *See*—
Craig, Harold M.; Wagner, Walter B.; and Strock, William J., 4,414,816., Cl. 60-757.000.

Wagner, Walter R., to UOP Inc. Apparatus for making filament reinforced plastic screen. 4,415,396., Cl. 156-425.000.

Walber, James P.: *See*—
Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,415,781., Cl. 200-5.00A.

Wald, Fritz; and Kalejs, Juris P., to Mobil Solar Energy Corporation. Control of atmosphere surrounding crystal growth zone. 4,415,401., Cl. 156-608.000.

Walker, Francis H.: *See*—
Fancher, Llewellyn W.; Walker, Francis H.; and Buren, Lawrence L., 4,415,351., Cl. 71-87.000.

Walker, Frank H., to General Motors Corporation. Hybrid gas turbine engine and flywheel propulsion system. 4,414,805., Cl. 60-39.161.

Walker, Robert A., to Boots Company PLC, The. Electrical apparatus. 4,415,944., Cl. 361-42.000.

Walkow, Arnold M.; and Linyaev, Eugene J., to Dresser Industries, Inc. Casing re-entry apparatus for use in inclined oil and gas boreholes. 4,415,030., Cl. 166-241.000.

Wallick, George C.: *See*—
Moeckel, George P.; and Wallick, George C., 4,415,999., Cl. 367-73.000.

Walter, John L.: *See*—
Pugh, John W.; Pikus, Francis W.; Graves, James A.; McMillan, John E.; and Walter, John L., 4,415,830., Cl. 313-331.000.

Wang, C. Wallace: *See*—
Gelernt, Barry; and Wang, C. Wallace, 4,415,402., Cl. 156-626.000.

Wang, Kang-Bo: *See*—
Schumacher, Ignatius; and Wang, Kang-Bo, 4,415,744., Cl. 560-20.000.

Wang Laboratories, Inc.: *See*—
Rasekhi, Houshang; Nelson, Alfred M.; Johnston, James P.; Rupinski, Frederick A.; and Hatfield, Walter B., Jr., 4,415,906., Cl. 346-74.500.

Wang, Teng-Ching. Folding chair having a reversible seat. 4,415,201., Cl. 297-57.000.

Ward, Frederick D.; and Denis, Claude, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Wind tunnel balance calibrator. 4,414,838., Cl. 73-1.00B.

Ward, Ian M.: *See*—
Capaccio, Giancarlo; Smith, Francis S.; and Ward, Ian M., 4,415,522., Cl. 264-210.800.

Warner Lambert Company: *See*—
Glass, Michael; Koch, Edwin R.; and Corsello, Vincent, 4,415,593., Cl. 426-4.000.

Warner, Steven B.: *See*—
Mininni, Robert M.; Garg, Sunil K.; George, Henry H., Jr.; Holt, Anne; and Warner, Steven B., 4,415,521., Cl. 264-176.00F.

Warrington, Ralph M.: *See*—
Engel, Robert F.; Long, Thomas E.; and Warrington, Ralph M., 4,415,293., Cl. 405-216.000.

Wasserman, Kurt J., to Insolar, Inc. Solar collection mat element. 4,414,960., Cl. 126-426.000.

Watanabe, Haruo: *See*—
Itoh, Hiroshi; and Watanabe, Haruo, 4,414,942., Cl. 123-339.000.

Watanabe, Kiyoshi: *See*—
Umezawa, Hamao; Ohno, Masaji; Hasegawa, Junzo; Hamaguchi, Shigeki; Ogura, Masahiro; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,415,657., Cl. 435-106.000.

Water Services of America, Inc.: *See*—
Baron, Walter J.; and Cleaver, Laird C., 4,415,022., Cl. 165-95.000.

Watkins, Fred E., to Camco, Incorporated. Apparatus for measuring bottom hole well conditions. 4,415,028., Cl. 166-206.000.

Wavetek: *See*—
Lo, Kwok S., 4,415,860., Cl. 328-22.000.

Waymatic, Inc.: *See*—
Wright, Clem B., 4,415,199., Cl. 297-159.000.

Webber, Furman L. Heater closure attachment for drums. 4,414,956., Cl. 126-59.000.

Webber, Robert C. Engine pressure-vacuum cooling system with a horizontal coolant storage tank. 4,414,926., Cl. 123-41.150.

Wech, Erich: *See—*
Kraus, Josef; and Wech, Erich, 4,414,900., Cl. 101-363.000.

Wedman, Leonard N.; and Bourque, Joseph A., to Kollmorgen Technologies Corporation. Dynamic magnetic preload bearing structure for a linear motor. 4,415,821., Cl. 310-12.000.

Weeks, Ronald D.; and Croney, David J., to International Standard Electric Corporation. Capacitors. 4,415,950., Cl. 361-433.000.

Wehnelt, Ulrich, to Siemens Aktiengesellschaft. Method for the manufacture of electrical components especially layer capacitors. 4,414,722., Cl. 29-25.420.

Weigle, William O.; and Morgan, Edward L., to Scripps Clinic and Research Foundation. Immune modulator peptides. 4,415,493., Cl. 260-112.50R.

Weiner, Antoine: *See—*
Metz, Paul; Schleimer, Francois; Legille, Edouard; Goedert, Jean; and Weiner, Antoine, 4,415,358., Cl. 75-58.000.

Weinert, Raymond J.: *See—*
Benton, Kenneth C.; Cmolik, Brian L.; and Weinert, Raymond J., 4,415,474., Cl. 502-117.000.

Weinstein, Arthur H., to Goodyear Tire & Rubber Company, The. Elastomeric interpolymer blends. 4,415,704., Cl. 525-76.000.

Weise, Lutz: *See—*
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Weise, Lutz; and Bleckmann, Hans-Wilhelm, 4,415,210., Cl. 303-116.000.

Weiss, Hermann; Linde, Rolf; Mauser, Wilfried; and Klotz, Erhard, to U.S. Philips Corporation. Device for producing images of a layer of an object from multiple shadow images with varying degrees of overlap. 4,416,019., Cl. 378-2.000.

Weiss, Martin J.: *See—*
Grudzinskas, Charles V.; and Weiss, Martin J., 4,415,746., Cl. 560-61.000.

Weissert, Helmut: *See—*
Hegemann, Karl-Rudolf; Weissert, Helmut; and Hinsken, Kurt, 4,415,142., Cl. 266-89.000.

Weitzel, Edward W., to Milliken Research Corporation. Mattress with non-woven fabric covered springs. 4,414,696., Cl. 5-475.000.

Wellcome Australia Limited: *See—*
Chappell, Anthony G., 4,415,314., Cl. 417-131.000.

Welles, Kenneth B., to General Electric Company. Rotatable magnetic field-sensing solid-state switch apparatus. 4,415,856., Cl. 324-208.000.

Wen Products, Inc.: *See—*
Rees, Spencer C., 4,415,149., Cl. 269-88.000.

Wereb, John A., to Instrument Components Co., Inc. Electrically powered vehicle control. 4,415,049., Cl. 180-6.500.

Wermuth, Jurgen, to Licentia Patent-Verwaltungs-GmbH. Circuit for dynamic compression and/or expansion. 4,415,866., Cl. 330-278.000.

Werner, Georg; and Wisniewski, Paul, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installations. 4,415,295., Cl. 405-291.000.

Werstak, Charles E.: *See—*
Miller, Donald E.; and Werstak, Charles E., 4,415,600., Cl. 426-613.000.

West American Sound, Inc.: *See—*
Zielke, Darrell W., 4,415,301., Cl. 414-31.000.

Westell, David A. Game board. 4,415,161., Cl. 273-285.000.

Westendorf Manufacturing Company: *See—*
Westendorf, Neal W.; and Langenfeld, Joseph W., 4,415,303., Cl. 414-519.000.

Westendorf, Neal W.; and Langenfeld, Joseph W., to Westendorf Manufacturing Company. Auger wagon. 4,415,303., Cl. 414-519.000.

Westerkamp, Jurgen; and Marquardt, Bruno, to Windmoller & Holscher. Mounting for printing cylinders or the like with adjustable side register. 4,414,898., Cl. 101-248.000.

Western Electric Company, Inc.: *See—*
Bowman, Howard C., 4,415,779., Cl. 179-175.30F.
Martin, Margaret L., 4,415,773., Cl. 179-18.0AD.
Shaw, Jonathan L., 4,415,062., Cl. 182-109.000.

Westinghouse Electric Corp.: *See—*
Bayless, John R.; Hargrove, Homer G.; and Thompson, Edwin G., 4,415,021., Cl. 165-76.000.
Cook, John W., 4,415,976., Cl. 364-472.000.
Cookson, Alan H., 4,415,763., Cl. 174-28.000.
Dailey, George F.; and Kauric, Charles E., 4,415,825., Cl. 310-270.000.
Davis, Steven B., 4,415,044., Cl. 174-138.00F.
Peterson, Steven H.; and Pensenstadler, David F., 4,414,858., Cl. 73-863.330.
Staehlin, John H., 4,415,130., Cl. 244-3.150.

Westrex Company, Asia: *See—*
Wincent, Tommy, 4,415,287., Cl. 400-322.000.

Westvaco Corporation: *See—*
Pollard, William T., 4,415,117., Cl. 229-39.00R.

Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, to Boehringer Ingelheim GmbH. Cephalosporin derivatives. 4,415,566., Cl. 424-246.000.

Wetzel, Robert E., to Dayco Corporation. Apparatus for making toothed belt. 4,415,397., Cl. 156-446.000.

Weyland, Horst: *See—*
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,415,557., Cl. 424-172.000.

Whipple, Rodger E., to Overly, Incorporated. Web dryer nozzle assembly. 4,414,757., Cl. 34-155.000.

White Consolidated Industries, Inc.: *See—*
Trout, David H., 4,414,871., Cl. 82-40.00R.

White, Eugene W. Solar heat engines. 4,414,814., Cl. 60-682.000.

White, Gary J.: *See—*
Kuhl, Virgil F.; and White, Gary J., 4,415,219., Cl. 339-195.00M.

Whitman Medical Corporation: *See—*
Gordon, Marvin; and Lichtenstein, Joseph, 4,415,288., Cl. 401-132.000.

Wichern, Petrus H. M.: *See—*
Beuse, Robert H. J.; van Iterson, Han R.; Jansen, Jan W.; and Wichern, Petrus H. M., 4,415,279., Cl. 374-204.000.

Wiech, Raymond E., Jr., to Witec Cayman Patents, Limited. Method of forming shaped metal alloy parts from metal or compound particles of the metal alloy components and compositions. 4,415,528., Cl. 419-46.000.

Wieloch, James E.: *See—*
Plummer, Steven J.; and Wieloch, James E., 4,416,021., Cl. 378-181.000.

Wiggins, Wayne T., to Standard Oil Company. Chemical etching of polymers for metallizing. 4,415,406., Cl. 156-668.000.

Wiggins, Wayne T.; and Gerry, Frank S., to Standard Oil Company, The. Tie layer for co-extruded acrylonitrile copolymers. 4,415,520., Cl. 264-171.000.

Wilcox, Howard A.: *See—*
Jelks, Edward C.; Kerber, George L.; and Wilcox, Howard A., 4,414,738., Cl. 29-579.000.

Wilcox, John R.: *See—*
Fair, Rickey F.; and Wilcox, John R., 4,414,959., Cl. 126-332.000.

Wilde, Dorn K.: *See—*
Bayliss, John A.; Colley, Stephen R.; Kravitz, Roy H.; Richardson, William S.; Wilde, Dorn K.; and Singh, Gurdev, 4,415,969., Cl. 364-200.000.

Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., to Provincial Holdings Ltd. Recovery of non-ferrous metals by thermal treatment of solutions containing non-ferrous and iron sulphates. 4,415,540., Cl. 423-99.000.

Willi Studer, Fabrik fuer elektronische Apparate: *See—*
Zogg, Urs, 4,415,820., Cl. 307-491.000.

Williams, Earl G.: *See—*
Maynard, Julian D.; and Williams, Earl G., 4,415,996., Cl. 367-8.000.

Williams, Gordon L.: *See—*
Houser, David E.; Kohn, Harold; and Williams, Gordon L., 4,415,113., Cl. 227-130.000.

Williams, Ralph J.: *See—*
Rudler, Helmut; and Williams, Ralph J., 4,414,998., Cl. 137-216.000.

Williams, Robert E.: *See—*
Smith-Williams, Margie M.; and Williams, Robert E., 4,415,182., Cl. 280-763.100.

Williams, Stephen L.: *See—*
Kounkel, Kenneth L.; Miller, Loren K.; Spriggel, Kenneth A.; and Williams, Stephen L., 4,414,843., Cl. 73-66.000.

Willis, Donald H.; and Clayburn, Randall C., to RCA Corporation. Television receiver ferroresonant power supply with permanent magnet biasing. 4,415,841., Cl. 315-400.000.

Willmouth, Frank M.: *See—*
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,415,523., Cl. 264-342.00R.

Wilsdorf, Doris; Wilsdorf, Heinz G. F.; and Adkins, Charles M., III, to University of Virginia, The. Electric brush. 4,415,635., Cl. 428-611.000.

Wilsdorf, Heinz G. F.: *See—*
Wilsdorf, Doris; Wilsdorf, Heinz G. F.; and Adkins, Charles M., III, 4,415,635., Cl. 428-611.000.

Wilson, Eddie K., Sr.; and Spigolon, Silvio J. Process for treating phospho-gypsum waste product from wet-acid process of making phosphoric acid. 4,415,543., Cl. 423-178.000.

Wilson, H. James, to Safetran Systems Corporation. Hall effect track circuit receiving element. 4,415,134., Cl. 246-34.0CT.

Wilson, Jack L., to Mobil Oil Corporation. Method for determining source and receiver statics in marine seismic exploration. 4,415,997., Cl. 367-15.000.

Wincent, Tommy, to Westrex Company, Asia. Printing device for printing characters in rows on data carriers. 4,415,287., Cl. 400-322.000.

Windmoller & Holscher: *See—*
Westerkamp, Jurgen; and Marquardt, Bruno, 4,414,898., Cl. 101-248.000.

Wink, Randall: *See—*
Fuchs, Gilbert; Crowley, Norman; and Wink, Randall, 4,415,325., Cl. 425-397.000.

Winter, Joseph: *See—*
Brenneman, William L.; Ungarean, Gary L.; Chatfield, Phillip A.; Pryor, Michael J.; and Winter, Joseph, 4,414,832., Cl. 72-8.000.

Winter, William E.: *See—*
Markley, Gerald E.; and Winter, William E., 4,415,441., Cl. 208-138.000.

Winterhoff, Horst, to Licentia Patent-Verwaltungs-GmbH. Method and apparatus for measuring static and dynamic torques in a contact free manner. 4,414,856., Cl. 73-862.360.

Wintzer, Klaus: *See—*
Lechner, Robert; and Wintzer, Klaus, 4,415,881., Cl. 340-347.0AD.

WIPAC Group Sales Limited: *See—*
French, John A. W., 4,415,135., Cl. 248-161.000.

Wirtz, John W.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,415,016., Cl. 164-429.000.

Wirtz Manufacturing Company, Inc.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,415,016., Cl. 164-429.000.

Wisconsin Alumni Research Foundation: *See*—
Rezakhany, Saeed, 4,414,977., Cl. 128-342.000.
Wisniewski, Paul: *See*—
Werner, Georg; and Wisniewski, Paul, 4,415,295., Cl. 405-291.000.
Witec Cayman Patents, Limited: *See*—
Wiech, Raymond E., Jr., 4,415,528., Cl. 419-46.000.
Witt, Enrique R.; Humphrey, William J.; and Cave, James P., to Celanese Corporation. Anaerobic treatment. 4,415,453., Cl. 210-615.000.
Witt, Henry J.: *See*—
Nochumson, Samuel; and Witt, Henry J., 4,415,428., Cl. 204-299.00R.
Witt, Ronald A., to Falk Corporation, The. Gear drive cooling. 4,414,861., Cl. 74-606.00A.
Wittmer, Charles M., to Perkin-Elmer Corporation, The. Spectrophotometer gas control system. 4,415,264., Cl. 356-315.000.
Wixlin, Inc.: *See*—
Brenneman, Ben, 4,415,312., Cl. 416-119.000.
Woerner, Robert J.: *See*—
Wagner, James C.; Barnard, James E.; and Woerner, Robert J., 4,416,020., Cl. 378-181.000.
Woessner, Warren D.: *See*—
Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,415,592., Cl. 424-331.000.
Wohl, Ronald A.: *See*—
Diamond, Julius; Morgan, Thomas K., Jr.; and Wohl, Ronald A., 4,415,587., Cl. 424-273.00R.
Woitun, Eberhard: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,415,566., Cl. 424-246.000.
Wolf, Erwin: *See*—
Kuhlmann, Gerhard; and Wolf, Erwin, 4,414,745., Cl. 30-373.000.
Wolf, Robert: *See*—
Schiel, Christian; and Wolf, Robert, 4,414,890., Cl. 100-162.00B.
Wolff, Douglas F., to Wolff Wire Corporation. Accessories for movable partition systems. 4,415,091., Cl. 211-50.000.
Wolff, Robert A.: *See*—
Schmidt, Hans; and Wolff, Robert A., 4,415,930., Cl. 358-191.100.
Wolff Wire Corporation: *See*—
Wolff, Douglas F., 4,415,091., Cl. 211-50.000.
Wolverton, Billy C., to United States of America, National Aeronautics and Space Administration. Method for treating wastewater using microorganisms and vascular aquatic plants. 4,415,450., Cl. 210-602.000.
Wong, Alan S.; Karwan, Mitchell S.; and Germane, Keith L., to Del Mar Avionics. Electrocardiograph computer display system. 4,414,981., Cl. 128-712.000.
Wood, Clair: *See*—
De Cuester, Robert J. M.; Hoeben, Louis J. M.; and Wood, Clair, 4,415,836., Cl. 315-50.000.
Wood, Edward T.: *See*—
Rehm, William A.; Dareing, Donald W.; and Wood, Edward T., 4,415,205., Cl. 299-5.000.
Woodard, Harry L.: *See*—
Romine, Donnie; and Woodard, Harry L., 4,415,080., Cl. 206-303.000.
Woolston, A. Brent: *See*—
Craemer, Robert H.; and Woolston, A. Brent, 4,415,978., Cl. 364-475.000.
Wortman, Donald W., to TII Industries, Inc. Equipment protector and energy saving apparatus. 4,415,943., Cl. 361-22.000.
Wovkulich, Peter M.: *See*—
Uskokovic, Milan R.; and Wovkulich, Peter M., 4,415,742., Cl. 549-475.000.
Wright, Clem B., to Waymatic, Inc. Folding picnic table. 4,415,199., Cl. 297-159.000.
Wright, William E.: *See*—
Gratzer, Nelson R.; and Wright, William E., 4,414,834., Cl. 72-58.000.
Wunderlich, Donald K.: *See*—
Kutta, Helmuth W.; and Wunderlich, Donald K., 4,415,337., Cl. 44-24.000.
Wust, Willi: *See*—
Carduck, Franz-Josef; Rahse, Wilfried; Wust, Willi; and Pabel, Hans, 4,415,124., Cl. 241-28.000.
Wysor, Michael S., to United States of America, Army. Silver metachloridine in treatment of infections. 4,415,565., Cl. 424-245.000.
Wyvratt, Matthew J., Jr.: *See*—
Harris, Elbert E.; Patchett, Arthur A.; Tristram, Edward W.; Thorsett, Eugene D.; and Wyvratt, Matthew J., Jr., 4,415,496., Cl. 260-239.30B.
Xerox Corporation: *See*—
Gruber, Robert J.; Bolte, Steven B.; and Agostine, Doretta, 4,415,646., Cl. 430-110.000.
Horgan, Anthony M., 4,415,639., Cl. 430-57.000.
Rees, James D.; and Durbin, John A., 4,415,258., Cl. 355-8.000.
Sprague, Robert A.; and Flores, Lawrence N., 4,415,915., Cl. 346-160.000.
Yabune, Hideo; and Uchida, Manabu, to Daicel Chemical Industries, Ltd. Process for preparation of cellulose acetate. 4,415,734., Cl. 536-76.000.
Yagi, Michiko, to Kabushiki Kaisha Advance Kaihatsu Kenkyujo. Tobacco smoke filter. 4,414,988., Cl. 131-334.000.
Yahashi, Satoru: *See*—
Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088., Cl. 209-687.000.
Yale University: *See*—
Ruddle, Frank H.; and Lin, Pin-Fang, 4,415,405., Cl. 156-645.000.
Yamada, Shigeki: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,415,504., Cl. 260-501.120.
Yamada, Shigeo; Takawashi, Tamio; and Sakakibara, Toshimitsu, to Mitsubishi Denki Kabushiki Kaisha. Breakthrough detection means for electric discharge machining apparatus. 4,415,791., Cl. 219-69.00G.
Yamada, Yasuhiro: *See*—
Hibino, Chitoshi; Kobari, Harukuni; Suzuki, Susumu; and Yamada, Yasuhiro, 4,416,010., Cl. 371-37.000.
Yamagata, Seiichi; and Sakai, Masaaki, to Toray Industries, Inc. Artificial fur having guard hair fibers and under fur fibers and a method for manufacturing the same. 4,415,611., Cl. 428-15.000.
Yamagata, Seiichi: *See*—
Nakayama, Takashi; Yamagata, Seiichi; and Kajita, Koji, 4,414,800., Cl. 57-236.000.
Yamagata, Toshio: *See*—
Schwartz, Michael A.; and Yamagata, Toshio, 4,414,895., Cl. 101-177.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, to Nippon Soken, Inc. Knock detecting apparatus for internal combustion engines. 4,414,840., Cl. 73-35.000.
Yamaguchi, Ken, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel damper device for motorcycle. 4,415,057., Cl. 180-227.000.
Yamaguchi, Takeshi: *See*—
Mitarai, Tsuyoshi; and Yamaguchi, Takeshi, 4,414,878., Cl. 84-1.190.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Matsumoto, Hiromitsu; and Sugiyama, Keiichi, 4,414,953., Cl. 123-571.000.
Nakada, Hiroyasu, 4,414,928., Cl. 123-73.0PP.
Sakurai, Yoshihiro, 4,414,929., Cl. 123-73.00R.
Yamakawa, Eiji: *See*—
Karasaki, Toshihiko; Gotoh, Takayuki; Namba, Yasuhiro; and Yamakawa, Eiji, 4,415,246., Cl. 354-25.000.
Yamamota, Takahito: *See*—
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Yamamota, Takahito, 4,415,828., Cl. 313-118.000.
Yamamoto, Takeshi: *See*—
Aida, Kenji; Yamamoto, Takeshi; and Kumazawa, Toshihiko, 4,415,508., Cl. 261-114.00R.
Yamamoto, Yosuke: *See*—
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, 4,415,620., Cl. 428-157.000.
Yamamura, Shiro: *See*—
Maruyama, Teruo; Yamauchi, Shinya; Yamamura, Shiro; and Morikawa, Yoshiyuki, 4,415,320., Cl. 418-150.000.
Yamanaka, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Vacuum interrupter. 4,415,787., Cl. 200-144.00B.
Yamashiro, Donald H.: *See*—
Janakiraman, Ramachandran; Buckley, Douglas I.; Yamashiro, Donald H.; and Hagman, James R., 4,415,546., Cl. 424-1.100.
Yamashita, Nobuo: *See*—
Nishioka, Kimihiko; and Yamashita, Nobuo, 4,415,240., Cl. 350-442.000.
Yamauchi, Shinya: *See*—
Maruyama, Teruo; Yamauchi, Shinya; Yamamura, Shiro; and Morikawa, Yoshiyuki, 4,415,320., Cl. 418-150.000.
Yamawaki, Mitsuru: *See*—
Tani, Saburo; Yamawaki, Mitsuru; Ogawa, Yukifumi; and Hirabe, Kenji, 4,415,381., Cl. 148-153.000.
Yamazaki, Ken; Yamamoto, Yosuke; Kinoyama, Takehisa; and Sasagawa, Kinichi, to Duskin Franchise Kabushiki Kaisha. Mat base plate. 4,415,620., Cl. 428-157.000.
Yamazaki, Takahiro: *See*—
Kanai, Hideo; Shinagawa, Akihiro; Yamazaki, Takahiro; and Itai, Reiichi, 4,415,411., Cl. 204-29.000.
Yamazaki, Tamotsu: *See*—
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, 4,415,569., Cl. 424-248.570.
Yanadori, Michio: *See*—
Koike, Keiichi; and Yanadori, Michio, 4,415,465., Cl. 252-70.000.
Yang, Yung h.: *See*—
Tominaga, Michiaki; Yang, Yung h.; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,415,572., Cl. 424-250.000.
Yanma Agricultural Equipment Company Limited: *See*—
Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, 4,415,088., Cl. 209-687.000.
Yano, Noriyuki; Yahashi, Satoru; and Shimazaki, Kanzo, to Seirei Industry Company Limited; and Yanma Agricultural Equipment Company Limited. Cylinder-type rotary sorting apparatus. 4,415,088., Cl. 209-687.000.
Yano, Yoichi: *See*—
Ugari, Takenori; and Yano, Yoichi, 4,416,024., Cl. 455-303.000.
Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., to Olin Corporation. Control of liquid-solid interface in electromagnetic casting. 4,415,017., Cl. 164-453.000.
Yasuda, Eturo; Asano, Mitsuru; and Ohta, Minoru, to Nippon Soken, Inc. Gas sensor. 4,415,876., Cl. 338-34.000.
Yasuo, Fujimura; Sadao, Tanaka; Isao, Matsunaga; Shiraki, Yasuyuki; Ikeda, Yugo; Yamazaki, Tamotsu; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Shindo, Minoru, to Chugai Seiyaku Kabushiki

Kaisha. Pyrazoloindazole derivatives and pharmaceutical composition containing the same. 4,415,569., Cl. 424-248.570.
Yeda Research and Development Company Ltd.: *See*—
Manassen, Joost; and Dror, Yaakov, 4,415,500., Cl. 260-429.00R.
Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,415,354., Cl. 71-103.000.
Yokoi, Gunpei, to Nintendo Co., Ltd. Figure displaying game apparatus. 4,415,153., Cl. 273-1.0GC.
Yonezawa, Toshio: *See*—
Koshino, Yutaka; Yonezawa, Toshio; Ajima, Takashi; and Ohshima, Jiro, 4,415,372., Cl. 148-1.500.
Yong, Samuel H.: *See*—
Chen, Rocky W.; Evans, Leah G.; Hohle, Deena G.; Turpin, Charles H.; Yong, Samuel H.; Mikulski, Barry S.; Kirk, David A.; Tracy, Gerald T.; and Tucker, Raymond W., 4,415,598., Cl. 426-394.000.
York, Earl D., to Standard Oil Company (Indiana). Two-stage centrifugal dedusting process. 4,415,430., Cl. 208-8.00R.
York, Earl D., to Standard Oil Company (Indiana). Hydrocarbon recovery method and apparatus. 4,415,432., Cl. 208-11.00R.
Yoshida Kogyo K. K.: *See*—
Kumano, Isamu, 4,414,718., Cl. 24-396.000.
Yoshihiro, Tadanobu: *See*—
Tsubuku, Mitsuro; and Yoshihiro, Tadanobu, 4,415,305., Cl. 414-753.000.
Yoshioka, Ryuzo: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,415,504., Cl. 260-501.120.
Yoshisato, Akiyuki, to Alps Electric Co., Ltd. Video clamp circuit. 4,415,929., Cl. 358-171.000.
Yoshizawa, Masayuki: *See*—
Koide, Atsushi; and Yoshizawa, Masayuki, 4,415,667., Cl. 435-212.000.
Yost, Kevin G., to Johnson & Johnson Products, Inc. Fluoridated dental articles. 4,414,990., Cl. 132-91.000.
Young, David M.; Mitchell, Donald F.; and Amey, Edward, to Fisons Limited. Inhalation device. 4,414,972., Cl. 128-200.230.
Young, Kenneth P.; Kyonka, Curtis P.; and Courtois, James A., to International Telephone and Telegraph Corporation. Fine grained metal composition. 4,415,374., Cl. 148-2.000.
Youree, Gene T.: *See*—
Peterson, John L., Jr.; Chaffin, Fred E.; and Youree, Gene T., 4,414,870., Cl. 82-36.00R.
Yu, Andrew B. C.; and John, Phillip M., to Sterling Drug Inc. Sustained-release pharmaceutical tablet and process for preparation thereof. 4,415,547., Cl. 424-19.000.
Yukawa, Koji; Murahashi, Takashi; and Sakurai, Isao, to Konishiroku Photo Industry Co., Ltd. An improved platen cover for a copying machine. 4,415,261., Cl. 355-75.000.
Zadera, Lumir, to George Fischer, Ltd. Process of compacting moulding sand. 4,415,015., Cl. 164-37.000.
Zaneveld, Lourens J. D.: *See*—
Joyce, Cathy L.; and Zaneveld, Lourens J. D., 4,415,585., Cl. 424-273.00P.
Zaremski, Donald R., to Allegheny Ludlum Steel Corporation. Method of controlling oxide scale formation and descaling thereof from metal articles. 4,415,415., Cl. 204-141.500.
Zarudiansky, Alain. Methods and apparatus for recording and or reproducing tactile sensations. 4,414,984., Cl. 128-774.000.
Zenith Radio Corporation: *See*—
Kulka, Raymond J.; and Trzyna, William A., 4,415,842., Cl. 315-411.000.
Lehnert, Stanley E., 4,415,348., Cl. 65-58.000.
Rogers, Melvin F., 4,415,932., Cl. 358-246.000.
Zhabilov, Harry P.; and Karavassileff, Todor Y., to DSO "Pharmachim". Compositions, processes for their preparation and method for treatment of neoplasms. 4,415,553., Cl. 424-95.000.
Zielke, Darrell W., to West American Sound, Inc. Cassette handling device. 4,415,301., Cl. 414-31.000.
Zogg, Urs, to Willi Studer, Fabrik fuer elektronische Apparate. Transistor differential circuit with exponential transfer characteristic. 4,415,820., Cl. 307-491.000.
Zschokke Wartmann AG: *See*—
Meier, Albert, 4,415,824., Cl. 310-89.000.
Zudkevitch, David; and Belsky, Stephen E., to Allied Corporation. Process for the separation of high boiling oxygenated compounds from mixtures with phenol and/or cresol. 4,415,409., Cl. 203-51.000.
Zumsteg, Alphonse, to Societe Suisse pour l'Industrie Horlogere Management Services SA. Oscillator circuit with digital temperature compensation. 4,415,870., Cl. 331-176.000.
Zunkel, Richard L.: *See*—
Schnarr, Raymond H.; and Zunkel, Richard L., 4,414,703., Cl. 16-52.000.
Zurkova, Eva: *See*—
Batz, Hans-Georg; Tanswell, Paul; Baier, Manfred; Bouchal, Karel; Kalal, Jaroslav; Svec, Frantisek; and Zurkova, Eva, 4,415,700., Cl. 524-548.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bally Manufacturing Corporation: *See*—
Nutting, David J.; and Frederiksen, Jeffrey E., Re. 31,441., Cl. 273-121.00A.

Block, Merrill. Two-phase transformer and welding circuit therefor. Re. 31,444., Cl. 219-116.000.

Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, to Hoffmann-La Roche Inc. Electrochemical electrode with heating means. Re. 31,440., Cl. 128-635.000.

Exxon Research and Engineering Co.: *See*—
Rosensweig, Ronald E., Re. 31,439., Cl. 34-1.000.

Frederiksen, Jeffrey E.: *See*—
Nutting, David J.; and Frederiksen, Jeffrey E., Re. 31,441., Cl. 273-121.00A.

Hammacher, Konrad: *See*—
Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, Re. 31,440., Cl. 128-635.000.

Hoffmann-La Roche Inc.: *See*—
Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, Re. 31,440., Cl. 128-635.000.

McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Company. Treatment of silica. Re. 31,443., Cl. 526-98.000.

Mindt, Wolfgang: *See*—
Eberhard, Patrick; Hammacher, Konrad; and Mindt, Wolfgang, Re. 31,440., Cl. 128-635.000.

Nutting, David J.; and Frederiksen, Jeffrey E., to Bally Manufacturing Corporation. Player operated game apparatus. Re. 31,441., Cl. 273-121.00A.

Owens-Illinois, Inc.: *See*—
Pfaender, Lawrence V., Re. 31,442., Cl. 65-90.000.

Pfaender, Lawrence V., to Owens-Illinois, Inc. Method and apparatus for manufacture of glass film. Re. 31,442., Cl. 65-90.000.

Phillips Petroleum Company: *See*—
McDaniel, Max P.; and Welch, Melvin B., Re. 31,443., Cl. 526-98.000.

Rosensweig, Ronald E., to Exxon Research and Engineering Co. Process for operating a magnetically stabilized fluidized bed. Re. 31,439., Cl. 34-1.000.

Welch, Melvin B.: *See*—
McDaniel, Max P.; and Welch, Melvin B., Re. 31,443., Cl. 526-98.000.

LIST OF REEXAM PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Honig, Helmut; and Pampouchidis, Georgios, to Vianova Kunstharz, A.G. Self-crosslinking resin emulsions for cathodically depositable coating compositions. B1 4,174,332., 11-15-83, Cl. 523-404.000.

La Rochelle, John H.: *See*—
Nielsen, Robert P.; and La Rochelle, John H., B1 3,962,136., Cl. 252-454.000.

Nielsen, Robert P.; and La Rochelle, John H., to Shell Oil Company. Catalyst for production of ethylene oxide. B1 3,962,136., 11-15-83, Cl. 252-454.000.

Pampouchidis, Georgios: *See*—
Honig, Helmut; and Pampouchidis, Georgios, B1 4,174,332., Cl. 523-404.000.

S. C. Johnson & Son, Inc.: *See*—
Verbrugge, Calvin J., B1 4,358,573., Cl. 526-272.000.

Shell Oil Company: *See*—
Nielsen, Robert P.; and La Rochelle, John H., B1 3,962,136., Cl. 252-454.000.

Verbrugge, Calvin J., to S. C. Johnson & Son, Inc. Waxy maleic anhydride alpha olefin terpolymers. B1 4,358,573., 11-15-83, Cl. 526-272.000.

Vianova Kunstharz, A.G.: *See*—
Honig, Helmut; and Pampouchidis, Georgios, B1 4,174,332., Cl. 523-404.000.

LIST OF DESIGN PATENTEES

Adkins, Glenn H., to Minibow, Inc. Miniature bow. 271,411., 11-15-83, Cl. D22-5.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Thiele, Hartmut, 271,349., Cl. D3-35.000.

Altman, Frank. Rotatable planter. 271,355., 11-15-83, Cl. D6-183.000.

Altman, Gary M.: *See*—
de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., 271,428., Cl. D26-85.000.

American Cyanamid Company: *See*—
Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., 271,418., Cl. D24-26.000.

American Home Products Corporation: *See*—
Cassini, Oleg L., 271,363., Cl. D7-137.000.
Cassini, Oleg L., 271,364., Cl. D7-137.000.
Cassini, Oleg L., 271,365., Cl. D7-137.000.
Cassini, Oleg L., 271,366., Cl. D7-137.000.

Andersen, Freddie J., to Woodchuck of Halton Hills Inc. Lamp. 271,429., 11-15-83, Cl. D26-104.000.

Antonacci, Frank; and Carluccio, Ronald. Blow dryer. 271,430., 11-15-83, Cl. D28-13.000.

Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., to Emerson Electric Co. Sewer cleaning machine. 271,436., 11-15-83, Cl. D32-14.000.

Banks, John E. Vest or similar article. 271,345., 11-15-83, Cl. D2-184.000.

Baroody, Terrance A. Coupler for structural tubes or the like. 271,375., 11-15-83, Cl. D8-382.000.

Baroody, Terrance A. Coupler saddle for structural tubes or the like. 271,376., 11-15-83, Cl. D8-382.000.

Bauer, Robert J. Barbell. 271,408., 11-15-83, Cl. D21-197.000.

Bausch & Lomb Incorporated: *See*—
Jordan, Paul A.; and Speaker, Edwin A., 271,399., Cl. D16-130.000.

Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., to Cornelius Company, The. Beverage dispensing valve. 271,368., 11-15-83, Cl. D7-398.000.

Bourke, Robert E., to NBS Incorporated. Camping trailer. 271,388., 11-15-83, Cl. D12-104.000.

Bourque, Rene, to Gamebridge Inc. Helmet. 271,347., 11-15-83, Cl. D2-232.000.

Breland, Thomas L., to Glasrock Products, Inc. Kit for a wound drainage system. 271,422., 11-15-83, Cl. D24-56.000.

Brown, Wilbert C.; and Pomponi, Roman F., to TIE/communications, Inc. Direct station selection console. 271,394., 11-15-83, Cl. D14-66.000.

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 271,357., 11-15-83, Cl. D6-198.000.

Butts, Lawrence D., to Scovill Inc. Knob escutcheon. 271,374., 11-15-83, Cl. D8-353.000.

C.V.B.G.: *See*—
Klim, Matthew J., 271,377., Cl. D9-378.000.

Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., to American Cyanamid Company. Surgical stapling instrument. 271,418., 11-15-83, Cl. D24-26.000.

Carluccio, Ronald: *See*—
Antonacci, Frank; and Carluccio, Ronald, 271,430., Cl. D28-13.000.

Carr, Peter B., to International Standard Electric Corporation. Telephone handset. 271,393., 11-15-83, Cl. D14-63.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,363., 11-15-83, Cl. D7-137.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,364., 11-15-83, Cl. D7-137.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,365., 11-15-83, Cl. D7-137.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,366., 11-15-83, Cl. D7-137.000.

Chan, Helen C., to Simmons, Alfred Eli; and Lung, Kui-Yan. Toy figure. 271,404., 11-15-83, Cl. D21-150.000.

Cigolle, Mark: *See*—
Lerner, Ralph; and Cigolle, Mark, 271,354., Cl. D6-175.000.

Clark Equipment Company: *See*—
Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., 271,397., Cl. D15-25.000.

Coca-Cola Company, The: *See*—
Credle, William S., Jr., 271,395., Cl. D15-7.000.

Colgate-Palmolive Company: *See*—
Seelig, Barry G., 271,431., Cl. D28-64.000.

Connecticut Cycle Accessories, Inc.: *See*—
Turkington, Mark; and Turkington, Philip, 271,389., Cl. D12-158.000.

Cornelius Company, The: *See*—
Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., 271,368., Cl. D7-398.000.

CPG Products Corp.: *See*—
Osborne, Thomas P., 271,406., Cl. D21-185.000.

Credle, William S., Jr., to Coca-Cola Company, The. Pump. 271,395., 11-15-83, Cl. D15-7.000.

Cuccia, Luke P. Watch face. 271,383., 11-15-83, Cl. D10-126.000.

Dansk Pressalit A/S: *See*—
Thygesen, Rud; and Sorensen, Johnny, 271,417., Cl. D23-71.000.

De Boer, Peter, to Gispen and Staalmeubel B.V. Stool. 271,352., 11-15-83, Cl. D6-29.000.

DeSoto, Inc.: *See*—
Lentz, William L.; Siegel, Richard A.; and Healy, Colin, 271,387., Cl. D11-145.000.

de Vos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Products Corporation. Lighting fixture. 271,427., 11-15-83, Cl. D26-85.000.

de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., to GTE Products Corporation. Lighting fixture. 271,428., 11-15-83, Cl. D26-85.000.

Dooley, Thomas E.: *See*—
Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Draege, George E.: *See*—
McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Draheim, Harvey J.: *See*—
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,357., Cl. D6-198.000.

Dupont, S. T.: *See*—
Malamoud, Jean G., 271,379., Cl. D10-38.000.

Emerson Electric Co.: *See*—
Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

ERO Electronic s.r.l.: *See*—
Zanazzo, Pietro; Mainardi, Guiliano; and Giorgetti, Rodolfo, 271,380., Cl. D10-49.000.

Faust, Steven M., to Warner-Lambert Company. Two color chewing gum. 271,344., 11-15-83, Cl. D1-12.000.

Fetterman, James W. Medical valve. 271,421., 11-15-83, Cl. D24-53.000.

Fortune, William S. Solder removing tool or the like. 271,371., 11-15-83, Cl. D8-51.000.

Fortune, William S. Pin straightening and prying tool or the like. 271,372., 11-15-83, Cl. D8-88.000.

Frye, Jessie L. D. Pendant or the like. 271,384., 11-15-83, Cl. D11-76.000.

Gamebridge Inc.: *See*—
Bourque, Rene, 271,347., Cl. D2-232.000.

Gesner, John E., to JEG, Inc. Snow scoop. 271,369., 11-15-83, Cl. D8-10.000.

Giorgetti, Rodolfo: *See*—
Zanazzo, Pietro; Mainardi, Guiliano; and Giorgetti, Rodolfo, 271,380., Cl. D10-49.000.

Gispen and Staalmeubel B.V.: *See*—
De Boer, Peter, 271,352., Cl. D6-29.000.

Glasrock Products, Inc.: *See*—
Breland, Thomas L., 271,422., Cl. D24-56.000.

Goldsworthy, Malcolm A., to Schott Industrial Glass Limited. Electric heating plate for a food warmer. 271,367., 11-15-83, Cl. D7-363.000.

Graham, John F.: *See*—
Henneberg, Helmut H.; and Graham, John F., 271,356., Cl. D6-188.000.

GTE Products Corporation: *See*—
de Vos, Hendrik A. J.; and Labouliere, Elzear R., 271,427., Cl. D26-85.000.
de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., 271,428., Cl. D26-85.000.

Hardy, Bruce N., to Silver Street Incorporated. Drumstick. 271,401., 11-15-83, Cl. D17-22.000.

Healy, Colin: *See*—
Lentz, William L.; Siegel, Richard A.; and Healy, Colin, 271,387., Cl. D11-145.000.

Hein, Paul R. Helmet. 271,346., 11-15-83, Cl. D2-231.000.

Helein, Charles H. Doll. 271,405., 11-15-83, Cl. D21-166.000.

Henneberg, Helmut H.; and Graham, John F., to Honeywell Information Systems Inc. Magnetic tape reel storage rack. 271,356., 11-15-83, Cl. D6-188.000.

Hesston Corporation: *See*—
McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Heweston, David I. Collapsible insulating container. 271,362., 11-15-83, Cl. D7-70.000.

Hoff, Patrick E., to Technology Applications Group, Inc. Monopolar electrosurgical device with dual 360° hand switch. 271,419., 11-15-83, Cl. D24-28.000.

Holland, Jackie D. Foldable livestock feeder. 271,433., 11-15-83, Cl. D30-13.000.

Honeywell Information Systems Inc.: *See*—
Henneberg, Helmut H.; and Graham, John F., 271,356., Cl. D6-188.000.

Ichikawa Press Industry Co., Ltd.: *See*—
Yabata, Hisao, 271,426., Cl. D26-29.000.

Ideas Materialized, Inc.: *See*—
Lukach, Daniel, 271,409., Cl. D21-207.000.

International Standard Electric Corporation: *See*—
Carr, Peter B., 271,393., Cl. D14-63.000.

Inui, Takayasu, to Kabushiki Kaisha Komatsu Seisakusho. Loading shovel. 271,396., 11-15-83, Cl. D15-24.000.

JEG, Inc.: *See*—
Gesner, John E., 271,369., Cl. D8-10.000.

Jordan, Paul A.; and Speaker, Edwin A., to Bausch & Lomb Incorporated. Ophthalmic instrument. 271,399., 11-15-83, Cl. D16-130.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Inui, Takayasu, 271,396., Cl. D15-24.000.

Kimbrough, Richard W. M.; and McElhaney, Craig J., to Quaker Oats Company, The. Toy doll house. 271,403., 11-15-83, Cl. D21-114.000.

Klim, Matthew J., to C.V.B.G. Bottle. 271,377., 11-15-83, Cl. D9-378.000.

Knighten, Chester. Violin. 271,400., 11-15-83, Cl. D17-17.000.

Koziatek, Jerome P.: *See*—
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Kroll, Frederick H. Counting swatter. 271,414., 11-15-83, Cl. D22-20.000.

Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., to Clark Equipment Company. Articulated loader vehicle body. 271,397., 11-15-83, Cl. D15-25.000.

Kullenback, Jan G. L. S. Toilet adapter for pet animals. 271,435., 11-15-83, Cl. D30-99.000.

Labouliere, Elzear R.: *See*—
de Vos, Hendrik A. J.; and Labouliere, Elzear R., 271,427., Cl. D26-85.000.
de Vos, Hendrik A. J.; Labouliere, Elzear R.; and Altman, Gary M., 271,428., Cl. D26-85.000.

Le, Walter. Picture frame. 271,358., 11-15-83, Cl. D6-234.000.

Le, Walter. Picture frame. 271,359., 11-15-83, Cl. D6-234.000.

Le, Walter. Picture frame. 271,360., 11-15-83, Cl. D6-234.000.

Le, Walter. Picture frame. 271,361., 11-15-83, Cl. D6-234.000.

Lendvay, Joseph G.: *See*—
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Lentz, William L.; Siegel, Richard A.; and Healy, Colin, to DeSoto, Inc. Miniature greenhouse. 271,387., 11-15-83, Cl. D11-145.000.

Lerner, Ralph; and Cigolle, Mark. Table. 271,354., 11-15-83, Cl. D6-175.000.

Li, Lehmann K.: *See*—
Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., 271,418., Cl. D24-26.000.

Liao, Sheng-Chung; and Neidhart, John W., to Mine Safety Appliances Company. Dust filtering respirator. 271,432., 11-15-83, Cl. D29-7.000.

Ljungberg, Per A.: *See*—
Sundeby, Bjorn K.; and Ljungberg, Per A., 271,423., Cl. D25-77.000.

Long, Paul D. Telescopic sight mount for pistol. 271,412., 11-15-83, Cl. D22-7.000.

Love, Hugh E. Bird feeder. 271,434., 11-15-83, Cl. D30-15.000.

Lukach, Daniel, to Ideas Materialized, Inc. Game projectile. 271,409., 11-15-83, Cl. D21-207.000.

Lung, Kui-Yan: *See*—
Chan, Helen C., 271,404., Cl. D21-150.000.

Lutron Electronics Co., Inc.: *See—*
Spira, Joel S.; and Mayo, Noel, 271,373., Cl. D8-302.000.

MacKrell, William B.: *See—*
Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., 271,368., Cl. D7-398.000.

Mainardi, Guiliano: *See—*
Zanazzo, Pietro; Mainardi, Guiliano; and Giorgetti, Rodolfo, 271,380., Cl. D10-49.000.

Malamoud, Jean G., to Dupont, S. T. Watchcase. 271,379., 11-15-83, Cl. D10-38.000.

Matsushita Electric Industrial Co, Ltd.: *See—*
Sumisha, Hidemichi; and Minamide, Seikou, 271,392., Cl. D14-11.000.

Mayer, Gerald J. Filter cartridge frame. 271,416., 11-15-83, Cl. D23-4.000.

Mayo, Noel: *See—*
Spira, Joel S.; and Mayo, Noel, 271,373., Cl. D8-302.000.

McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevick, Timothy A.; and Ten Eyck, Richard E., to Hesston Corporation. Rear mounted mower for tractors. 271,398., 11-15-83, Cl. D15-27.000.

McElhaney, Craig J.: *See—*
Kimbrough, Richard W. M.; and McElhaney, Craig J., 271,403., Cl. D21-114.000.

Miller, Daniel R., to Nestier Corporation. Box. 271,438., 11-15-83, Cl. D34-43.000.

Minamide, Seikou: *See—*
Sumisha, Hidemichi; and Minamide, Seikou, 271,392., Cl. D14-11.000.

Mine Safety Appliances Company: *See—*
Liao, Sheng-Chung; and Neidhart, John W., 271,432., Cl. D29-7.000.

Minibow, Inc.: *See—*
Adkins, Glenn H., 271,411., Cl. D22-5.000.

Moriyama, Hideo, to Moriyama Sangyo Kabushiki Kaisha. Combined fluorescent and incandescent lamp adapter. 271,425., 11-15-83, Cl. D26-26.000.

Moriyama Sangyo Kabushiki Kaisha: *See—*
Moriyama, Hideo, 271,425., Cl. D26-26.000.

Morton, Edward W.: *See—*
Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Motorola, Inc.: *See—*
Scheid, William J., 271,391., Cl. D13-5.000.

Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., to Questor Corporation. Crib. 271,351., 11-15-83, Cl. D6-16.000.

Mumma, Thurman H. Fish lure. 271,415., 11-15-83, Cl. D22-27.000.

Munroe, Thomas. Belt attached fishing rod holder. 271,413., 11-15-83, Cl. D22-14.000.

NBS Incorporated: *See—*
Bourke, Robert E., 271,388., Cl. D12-104.000.

Neidhart, John W.: *See—*
Liao, Sheng-Chung; and Neidhart, John W., 271,432., Cl. D29-7.000.

Nestier Corporation: *See—*
Miller, Daniel R., 271,438., Cl. D34-43.000.

North American Philips Electric Corp.: *See—*
Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Novak, Gyora. Sculpture or the like. 271,385., 11-15-83, Cl. D11-131.000.

Noveske, Walter J.: *See—*
Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

Olivieri, Icaro, to Warrington Inc. Figure skate blade. 271,410., 11-15-83, Cl. D21-225.000.

Osborne, Thomas P., to CPG Products Corp. Toy butterfly. 271,406., 11-15-83, Cl. D21-185.000.

Pomponi, Roman F.: *See—*
Brown, Wilbert C.; and Pomponi, Roman F., 271,394., Cl. D14-66.000.

Pulos, Arthur J.: *See—*
Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

Quaker Oats Company, The: *See—*
Kimbrough, Richard W. M.; and McElhaney, Craig J., 271,403., Cl. D21-114.000.

Questor Corporation: *See—*
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Ranua, Walter E.: *See—*
Belland, Terrance G.; MacKrell, William B.; and Ranua, Walter E., 271,368., Cl. D7-398.000.

Raz, Zeev. Bathroom cabinet. 271,353., 11-15-83, Cl. D6-104.000.

Reichmann, Richard H.: *See—*
Campbell, Jay E.; Reichmann, Richard H.; and Li, Lehmann K., 271,418., Cl. D24-26.000.

Robbins, Richard J.: *See—*
McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Robbins, Thomas R. Combined key holder and coin purse. 271,350., 11-15-83, Cl. D3-62.000.

Sagaser, Thomas M.: *See—*
Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., 271,397., Cl. D15-25.000.

San Antonio, Louis. Ceramic clean-up trim tool. 271,370., 11-15-83, Cl. D8-14.000.

Schaffer, Michael J.: *See—*
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,357., Cl. D6-198.000.

Scheid, William J., to Motorola, Inc. Battery charging unit for a portable radio or similar article. 271,391., 11-15-83, Cl. D13-5.000.

Schott Industrial Glass Limited: *See—*
Goldsworthy, Malcolm A., 271,367., Cl. D7-363.000.

Schramm, Buford J. Helicopter. 271,390., 11-15-83, Cl. D12-327.000.

Scovill Inc.: *See—*
Butts, Lawrence D., 271,374., Cl. D8-353.000.

Seelig, Barry G., to Colgate-Palmolive Company. Dental floss container. 271,431., 11-15-83, Cl. D28-64.000.

Sevick, Timothy A.: *See—*
McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Seymour, Allen: *See—*
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 271,351., Cl. D6-16.000.

Sharber, Jerry L. Note paper retrieval tray. 271,402., 11-15-83, Cl. D19-92.000.

Sharp, Amelia A. Wall hanging. 271,386., 11-15-83, Cl. D11-133.000.

Sidrak, Fahim R. Sine template. 271,381., 11-15-83, Cl. D10-62.000.

Siegel, Richard A.: *See—*
Lentz, William L.; Siegel, Richard A.; and Healy, Colin, 271,387., Cl. D11-145.000.

Sierra, Oscar A. Foot massager and leg exerciser. 271,420., 11-15-83, Cl. D24-36.000.

Silver Street Incorporated: *See—*
rlardy, Bruce N., 271,401., Cl. D17-22.000.

Simmons, Alfred Eli: *See—*
Chan, Helen C., 271,404., Cl. D21-150.000.

Simmons Universal Corporation: *See—*
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 271,357., Cl. D6-198.000.

Skwirut, Henry: *See—*
Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 271,424., Cl. D26-26.000.

Sorensen, Johnny: *See—*
Thygesen, Rud; and Sorensen, Johnny, 271,417., Cl. D23-71.000.

Speaker, Edwin A.: *See—*
Jordan, Paul A.; and Speaker, Edwin A., 271,399., Cl. D16-130.000.

Spira, Joel S.; and Mayo, Noel, to Lutron Electronics Co., Inc. Combined light dimmer knob and escutcheon therefor. 271,373., 11-15-83, Cl. D8-302.000.

Stein, Jerome E. Circular navigational rule aid. 271,382., 11-15-83, Cl. D10-65.000.

Sumisha, Hidemichi; and Minamide, Seikou, to Matsushita Electric Industrial Co, Ltd. Cassette for video tape recorder. 271,392., 11-15-83, Cl. D14-11.000.

Sun, George C. Transparent box. 271,378., 11-15-83, Cl. D9-424.000.

Sundeby, Bjorn K.; and Ljungberg, Per A. Beam. 271,423., 11-15-83, Cl. D25-77.000.

Sweeney, Paul B.: *See—*
Babb, Larry F.; Noveske, Walter J.; Pulos, Arthur J.; and Sweeney, Paul B., 271,436., Cl. D32-14.000.

Technology Applications Group, Inc.: *See—*
Hoff, Patrick E., 271,419., Cl. D24-28.000.

Ten Eyck, Richard E.: *See—*
McCanse, James E.; Draege, George E.; Robbins, Richard J.; Sevick, Timothy A.; and Ten Eyck, Richard E., 271,398., Cl. D15-27.000.

Thiele, Hartmut, to Agfa-Gevaert Aktiengesellschaft. Case for a video cassette. 271,349., 11-15-83, Cl. D3-35.000.

Thiot, Richard E. Laundry room clothes hanger. 271,437., 11-15-83, Cl. D32-58.000.

Thorneburg, James L. Sock. 271,348., 11-15-83, Cl. D2-331.000.

Thygesen, Rud; and Sorensen, Johnny, to Dansk Pressalit A/S. Combined toilet seat and cover, or similar article. 271,417., 11-15-83, Cl. D23-71.000.

TIE/communications, Inc.: *See—*
Brown, Wilbert C.; and Pomponi, Roman F., 271,394., Cl. D14-66.000.

Turkington, Mark; and Turkington, Philip, to Connecticut Cycle Accessories, Inc. Luggage carrier. 271,389., 11-15-83, Cl. D12-158.000.

Turkington, Philip: *See—*
Turkington, Mark; and Turkington, Philip, 271,389., Cl. D12-158.000.

Wagner, Oryn B.: *See—*
Kuhn, Patrick; Sagaser, Thomas M.; and Wagner, Oryn B., 271,397., Cl. D15-25.000.

Warner-Lambert Company: *See—*
Faust, Steven M., 271,344., Cl. D1-12.000.

Warrington Inc.: *See—*
Olivieri, Icaro, 271,410., Cl. D21-225.000.

Woodchuck of Halton Hills Inc.: *See—*
Andersen, Freddie J., 271,429., Cl. D26-104.000.

Wright, Forrest S. Dumbbell. 271,407., 11-15-83, Cl. D21-197.000.

Yabata, Hisao, to Ichikawa Press Industry Co., Ltd. Fog light. 271,426., 11-15-83, Cl. D26-29.000.

Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., to North American Philips Electric Corp. Compact fluorescent lamp unit. 271,424., 11-15-83, Cl. D26-26.000.

Zanazzo, Pietro; Mainardi, Guiliano; and Giorgetti, Rodolfo, to ERO Electronic s.r.l. Electronic thermostat indicator or similar article. 271,380., 11-15-83, Cl. D10-49.000.

LIST OF PLANT PATENTEES

Chamberlin, Thomas O., Sr., to H. P. Metzler & Sons, Inc. Peach tree. 5,139., 11-15-83, Cl. 43.000.
Chamberlin, Thomas O., Sr., to H. P. Metzler & Sons, Inc. Peach tree 'August Sun'. 5,140., 11-15-83, Cl. 43.000.
Garabedian, John M. Plum tree. 5,137., 11-15-83, Cl. 38.000.
H. P. Metzler & Sons, Inc.: *See*—
Chamberlin, Thomas O., Sr., 5,139., Cl. 43.000.
Chamberlin, Thomas O., Sr., 5,140., Cl. 43.000.
Zaiger, C. Floyd. Apricot tree (Spring Giant). 5,138., 11-15-83, Cl. 39.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 15, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

67 4,414,691
160 4,414,692
435 4,414,693

CLASS 3

13 4,414,694

CLASS 4

542 4,414,695

CLASS 5

475 4,414,696

CLASS 7

107 4,414,697
170 4,414,698

CLASS 8

114.6 4,415,331
444 4,415,332
524 4,415,333
694 4,415,334

CLASS 15

87 4,414,699
105 4,414,700
4,414,701

CLASS 16

35 R 4,414,702
52 4,414,703
223 4,414,704
225 4,414,705
370 4,414,706

CLASS 17

1 F 4,414,707
1 R 4,414,708
71 4,414,709

CLASS 19

105 4,414,710

CLASS 24

3 L 4,414,716
30.5 R 4,414,717
129 C 4,414,711
129 R 4,414,712
193 4,414,713
265 WS 4,414,714
4,414,719
283 4,414,715
396 4,414,718

CLASS 27

21 4,414,720

CLASS 29

25.42 4,414,722
26 A 4,414,723
39 4,414,724
156.4 R 4,414,725
156.5 A 4,414,726
159.1 4,414,728
159.2 4,414,729
401.1 4,414,727
426.3 4,414,730
453 4,414,731
464 4,414,734
568 4,414,732
4,414,733
578 4,414,737
579 4,414,738
727 4,414,739
747 4,414,736
751 4,414,740
837 4,414,741
879 4,414,735
882 4,414,742

CLASS 30

124 4,414,743
151 4,414,744
373 4,414,745

CLASS 33

125 C 4,414,746
174 P 4,414,747
174 Q 4,414,748
180 R 4,414,749
185 R 4,414,750
265 4,414,751
320 4,414,752
356 4,414,753
363 K 4,414,754

CLASS 34

1 Re.31,439
4 4,414,755
23 4,414,756
155 4,414,757
233 4,414,758

CLASS 36

11.5 4,414,759
29 4,414,760
50 4,414,761
117 4,414,762
134 4,414,763

CLASS 37

141 T 4,414,764

CLASS 38

54 4,414,765
77.83 4,414,766

CLASS 40

429 4,414,767
584 4,414,768

CLASS 42

70 R 4,414,769
90 4,414,770

CLASS 43

4 4,414,771
42.36 4,414,772
97 4,414,773

CLASS 44

1 C 4,415,335
13 4,415,336
24 4,415,337
51 4,415,338

CLASS 46

22 4,414,774
241 4,414,775

CLASS 47

56 4,414,776

CLASS 48

62 R 4,415,339

CLASS 49

141 4,414,777
199 4,414,778
351 4,414,779

CLASS 51

26 4,414,780
170 MT 4,414,781
4,414,782
267 4,414,783

CLASS 52

73 4,414,784
169.1 4,414,785
506 4,414,786
643 4,414,787

CLASS 53

436 4,414,788
566 4,414,789

CLASS 54

2 4,414,790
44 4,414,791

CLASS 55

25 4,415,340
53 4,415,341
96 4,415,342
379 4,415,343
523 4,415,344

CLASS 56

10.2 4,414,792
14.4 4,414,793
16.6 4,414,794
328 TS 4,414,795
341 4,414,796
400.19 4,414,797

CLASS 57

22 4,414,798
4,414,799
236 4,414,800
288 4,414,801
293 4,414,802
340 4,414,803

CLASS 60

39.141 4,414,804
39.161 4,414,805
204 4,414,807
372 4,414,808
424 4,414,809
535 4,414,810
589 4,414,811
641.14 4,414,812
641.2 4,414,817
655 4,414,813
682 4,414,814
726 4,414,815
757 4,414,816

CLASS 62

28 4,415,345
35 4,415,346
176.1 4,414,818
222 4,414,819
226 4,414,820
235 4,414,821
256 4,414,822
266 4,414,823
295 4,414,824
374 4,414,825

CLASS 65

4.21 4,415,347
58 4,415,348
90 Re.31,442
137 4,415,349

CLASS 66

60 H 4,414,827
75.2 4,414,806
207 4,414,826

CLASS 70

84 4,414,828
160 4,414,829
252 4,414,830
276 4,414,831

CLASS 71

77 4,415,350
87 4,415,351
88 4,415,352
100 4,415,353
103 4,415,354
121 4,415,355

CLASS 72

8 4,414,832
13 4,414,833
58 4,414,834
71 4,414,835
349 4,414,836

CLASS 73

1 B 4,414,837
4,414,838
23 4,414,839
35 4,414,840
61 R 4,414,841
61.1 C 4,414,842
66 4,414,843
104 4,414,844
119 A 4,414,845
151 4,414,846
204 4,414,847
290 V 4,414,849
497 4,414,848
599 4,414,850
706 4,414,851
765 4,414,852
766 4,414,853
847 4,414,854
862.36 4,414,855
4,414,856
863.11 4,414,857
863.33 4,414,858

CLASS 74

417 4,414,859
579 E 4,414,860
606 A 4,414,861
788 4,414,862
866 4,414,863

CLASS 75

21 4,415,356
29 4,415,357
58 4,415,358
60 4,415,359
65 R 4,415,360
124 4,415,361
130 B 4,415,362
229 4,415,363

CLASS 81

3 R 4,414,864
3.1 R 4,414,865
3.46 R 4,414,866
177 UJ 4,414,867
416 4,414,868

CLASS 82

4 R 4,414,869
36 R 4,414,870
40 R 4,414,871

CLASS 83

171 4,414,872
311 4,414,873
488 4,414,874
508.3 4,414,875
830 4,414,876

CLASS 84

1.13 4,414,877
1.19 4,414,878
379 4,414,879

CLASS 89

193 4,414,880

CLASS 91

216 R 4,414,881
442 4,414,882
467 4,414,883

CLASS 99

304 4,414,884
494 4,414,885
495 4,414,886

CLASS 100

45 4,414,887
88 4,414,888
162 B 4,414,889
4,414,890
245 4,414,891

CLASS 101

44 4,414,892
93.15 4,414,893
123 4,414,894
177 4,414,895
211 4,414,896
216 4,414,897
248 4,414,898
331 4,414,899
363 4,414,900

CLASS 102

206 4,414,901
531 4,414,902

CLASS 104

244.1 4,414,903

CLASS 106

74 4,415,364
85 4,415,365
86 4,415,366
89 4,415,367

CLASS 110

102 4,414,904
245 4,414,905
293 4,414,906

CLASS 112

158 B 4,414,907
169 4,414,908
274 4,414,909

CLASS 114

218 4,414,910
219 4,414,911

CLASS 116

5 4,414,912

CLASS 118

46 4,414,913
63 4,414,914
213 4,414,915
306 4,414,918
612 4,414,916
695 4,414,917

CLASS 119

3 4,414,919
29 4,414,920
4,414,921
51 R 4,414,922

CLASS 122

7 R 4,414,923

CLASS 123

25 E 4,414,924
41.12 4,414,925
41.15 4,414,926
62 4,414,927
73 PP 4,414,928
73 R 4,414,929
78 E 4,414,930
90.16 4,414,931
142.5 R 4,414,932
182 4,414,933
192 B 4,414,934
198 D 4,414,937
198 F 4,414,935
4,414,936
229 4,414,938
274 4,414,939
299 4,414,940
326 4,414,941
339 4,414,942
4,414,943
4,414,944
368 4,414,945
417 4,414,946
446 4,414,947
452 4,414,948
479 4,414,949
4,414,950
538 4,414,951
559 4,414,952
571 4,414,953
606 4,414,954

CLASS 125

11 T 4,414,955

CLASS 126

59 4,414,956
121 4,414,957
332 4,414,959
426 4,414,960
432 4,414,961
450 4,414,958

CLASS 128

6 4,414,962
60 4,414,963
81 R 4,414,964
87 R 4,414,965
92 B 4,414,966
4,414,967
132 D 4,414,968
133 4,414,969
156 4,414,970
159 4,414,971
200.23 4,414,972
206.15 4,414,973
305 4,414,974
314 4,414,975
325 4,414,721
334 R 4,414,976
342 4,414,977
419 F 4,414,979
419 PG 4,414,978
635 Re.31,440
664 4,414,980
712 4,414,981
716 4,414,982
747 4,414,983
774 4,414,984
782 4,414,985
785 4,414,986

CLASS 131

296 4,414,987
334 4,414,988
339 4,414,989

CLASS 132

45 R 4,414,991
91 4,414,990
129 4,414,992

CLASS 134

10 4,415,368
22.12 4,415,369

CLASS 135

104 4,414,993

CLASS 136

233 4,415,758
246 4,415,759
258 4,415,760

CLASS 137

38 4,414,994
77 4,414,995
101.27 4,414,996
151 4,414,997
216 4,414,998
240 4,414,999
318 4,415,000
497 4,415,001
625.23 4,415,002
843 4,415,003
884 4,415,004

CLASS 138

96 T 4,415,005
115 4,415,006

CLASS 139

329 4,415,007
370.2 4,415,008
435 4,415,009
439 4,415,010

CLASS 141

284 4,415,011

CLASS 148

1.5 4,415,370
4,415,371
4,415,372
4,415,373
2 4,415,374
11.5 F 4,415,375
12 F 4,415,376
12 R 4,415,377
12.1 4,415,378
16 4,415,379
101 4,415,380
153 4,415,381
4,415,382
187 4,415,383
4,415,384
189 4,415,385

CLASS 150

51 4,415,012

CLASS 152

367 4,415,013

CLASS 156

64 4,415,386
69 4,415,387
78 4,415,388
91 4,415,389
187 4,415,390
4,415,391
244.13 4,415,392
4,415,393
379.8 4,415,394
384 4,415,395
425 4,415,396
446 4,415,397
470 4,415,398
475 4,415,399
555 4,415,400
608 4,415,401
626 4,415,402
634 4,415,403
635 4,415,404
645 4,415,405
668 4,415,406

CLASS 157

1.28 4,415,014

CLASS 159

13 A 4,415,407

CLASS 162

198 4,415,408

CLASS 164

37 4,415,015
429 4,415,016
453 4,415,017

CLASS 165

41 4,415,018
47 4,415,019
76 4,415,020
4,415,021
95 4,415,022
122 4,415,023
160 4,415,024
185 4,415,025

CLASS 166

97 4,415,026
113 4,415,027
206 4,415,028
212 4,415,029
241 4,415,030
261 4,415,031
273 4,415,032
274 4,415,033
302 4,415,034
308 4,415,035
324 4,415,036
331 4,415,037
373 4,415,038

CLASS 172

47 4,415,039
225 4,415,040
551 4,415,041
749 4,415,042
776 4,415,043

CLASS 174

25 R 4,415,761
28 4,415,762
4,415,763
37 4,415,764
72 A 4,415,765
138 F 4,415,044

CLASS 175

9 4,415,045
56 4,415,046
305 4,415,047

CLASS 177

5 4,415,048

CLASS 178

30 4,415,766

CLASS 179

2 C 4,415,769
2 DP 4,415,774
2 EB 4,415,770
5 R 4,415,771
18 AD 4,415,773
78 R 4,415,775
81 R 4,415,776
170 NC 4,415,777
175.1 R 4,415,778
175.3 F 4,415,779

CLASS 180

6.48 4,415,050
6.5 4,415,049
65 R 4,415,051
69 R 4,415,052
74 4,415,053
79.1 4,415,054
198 4,415,055
210 4,415,056
227 4,415,057
247 4,415,058

CLASS 181

250 4,415,059
272 4,415,060

CLASS 182

92 4,415,061
109 4,415,062
230 4,415,063

CLASS 184

15 R 4,415,064

CLASS 186

39 4,415,065

CLASS 187

9 R 4,415,066

CLASS 188

71.5 4,415,067
72.3 4,415,068
82.84 4,415,069
264 F 4,415,070
352 4,415,071

CLASS 192

45 4,415,072
54 4,415,073

CLASS 193

37 4,415,074

CLASS 200

5 A 4,415,780
4,415,781
6 A 4,415,782
11 A 4,415,783
35 R 4,415,784
38 B 4,415,785
61.91 4,415,786
144 B 4,415,787

CLASS 202

177 4,415,075

CLASS 203

51 4,415,409

CLASS 204

2.1 4,415,410
29 4,415,411
67 4,415,412
98 4,415,413
129.3 4,415,414
141.5 4,415,415
147 4,415,416
159.24 4,415,417
180 G 4,415,418
192 C 4,415,419
192 N 4,415,420
4,415,421
199 4,415,422
212 4,415,423
257 4,415,424
279 4,415,425
290 R 4,415,426
298 4,415,427
299 R 4,415,428

CLASS 206

5.1 4,415,076
44 R 4,415,077
45.14 4,415,078
45.34 4,415,079
303 4,415,080
311 4,415,081
334 4,415,083
431 4,415,082
461 4,415,084
526 4,415,085
564 4,415,086
632 4,415,087

CLASS 208

8 LE 4,415,429
8 R 4,415,430
4,415,431
11 R 4,415,432
4,415,433
4,415,434
65 4,415,435
89 4,415,436
120 4,415,437
4,415,438
4,415,439
4,415,440
138 4,415,441
177 4,415,442
355 4,415,443

CLASS 209

3 4,415,444
5 4,415,445
687 4,415,088

CLASS 210

101 4,415,446
321.1 4,415,447
333.1 4,415,448
406 4,415,449
602 4,415,450
610 4,415,451
614 4,415,452
615 4,415,453
616 4,415,454
654 4,415,455
673 4,415,456
682 4,415,457
727 4,415,458
747 4,415,459
754 4,415,460
757 4,415,461
767 4,415,462

CLASS 211

13 4,415,089
49 S 4,415,090
50 4,415,091
60 R 4,415,092
113 4,415,093

CLASS 215

252 4,415,094
329 4,415,095
343 4,415,096

CLASS 219

10.49 R 4,415,788
10.55 B 4,415,789
4,415,790
69 G 4,415,791
98 4,415,792
110 4,415,793
116 Re.31,444
121 LM 4,415,794
121 PH 4,415,795
253 4,415,796
273 4,415,797
345 4,415,798
400 4,415,799
497 4,415,800

CLASS 220

90.4 4,415,097

CLASS 221

202 4,415,098

CLASS 222

94 4,415,099
108 4,415,100
288 4,415,101
411 4,415,102
590 4,415,103
610 4,415,104

CLASS 224

41 4,415,105
221 4,415,106

CLASS 225

93.5 4,415,107

CLASS 226

138 4,415,108
181 4,415,109

CLASS 227

10 4,415,110
19 4,415,111
4,415,112
130 4,415,113

CLASS 228

57 4,415,114
170 4,415,115
180 A 4,415,116

CLASS 229

39 R 4,415,117

CLASS 235

101 4,415,801
382 4,415,802

CLASS 237

12.3 A 4,415,118
19 4,415,119

CLASS 238

8 4,415,120

CLASS 239

229 4,415,121
327 4,415,122
425 4,415,123

CLASS 241

28 4,415,124

CLASS 242

18 DD 4,415,125
43 R 4,415,126
58.1 4,415,127
66 4,415,128
84.2 A 4,415,129

CLASS 244

3.15 4,415,130
13 4,415,131
48 4,415,132
53 R 4,415,133

CLASS 246

34 CT 4,415,134

CLASS 248

161 4,415,135
181 4,415,136
629 4,415,137

CLASS 249

114 R 4,415,138

CLASS 250

214 A 4,415,803
255 4,415,804
260 4,415,805
339 4,415,806
363 S 4,415,807
367 4,415,808
370 4,415,237
432 R 4,415,809
484.1 4,415,810
560 4,415,811

CLASS 251

62 4,415,139

CLASS 252

8.55 R 4,415,463
62.51 4,415,464
70 4,415,465
4,415,466
181 4,415,467
182 4,415,468
4,415,469
299.63 4,415,470
301.36 4,415,471
321 4,415,472
373 4,415,473
454 B1 3,962,136
514 4,415,486
546 4,415,487
547 4,415,488
558 4,415,489

CLASS 254

371 4,415,140

CLASS 256

69 4,415,141

CLASS 260

112.5 R 4,415,491
4,415,492
4,415,493
196 4,415,494
239 D 4,415,495
239.3 B 4,415,496
245.2 T 4,415,497
351.1 4,415,498
410.9 N 4,415,499
429 R 4,415,500
429.3 4,415,501
463 4,415,502
501.12 4,415,504
502.5 F 4,415,503
543 P 4,415,505
986 4,415,506

CLASS 261

18 B 4,415,507
114 R 4,415,508

CLASS 264

1.3 4,415,509
8 4,415,510
4,415,511
9 4,415,512
45.4 4,415,513
53 4,415,514
68 4,415,515
112 4,415,516
118 4,415,517
166 4,415,518
171 4,415,519
4,415,520
176 F 4,415,521
210.8 4,415,522
342 R 4,415,523

CLASS 266

89 4,415,142
112 4,415,143
228 4,415,144
253 4,415,145

CLASS 267

9 C 4,415,146
111 4,415,147
122 4,415,148

CLASS 269

88 4,415,149

CLASS 272

63 4,415,150
65 4,415,151
73 4,415,152

CLASS 273

1 GC 4,415,153
26 A 4,415,154
26 E 4,415,155
77 A 4,415,156
86 B 4,415,157
121 A Re.31,441
153 S 4,415,158
187 A 4,415,159
243 4,415,160
285 4,415,161
371 4,415,162
411 4,415,163

CLASS 277

1 4,415,164
12 4,415,171
27 4,415,165
51 4,415,166
88 4,415,167
96.1 4,415,168
125 4,415,169
163 4,415,170

CLASS 279

33 4,415,172

CLASS 280

47.13 R 4,415,173
411 C 4,415,174
460 A 4,415,175
612 4,415,176
650 4,415,177
4,415,180
664 4,415,178
700 4,415,181
713 4,415,179
763.1 4,415,182

CLASS 281

31 4,415,183

CLASS 285

47 4,415,184
114 4,415,185
142 4,415,186
173 4,415,187
420 4,415,188

CLASS 290

38 R 4,415,812
44 4,415,813
55 4,415,814

CLASS 292

196 4,415,189
256.6 4,415,190
346 4,415,191
347 4,415,192

CLASS 294

102 A 4,415,193

CLASS 296

76 4,415,194
146 4,415,195
201 4,415,196
216 4,415,197

CLASS 297

6 4,415,198
57 4,415,201
159 4,415,199
174 4,415,200
217 4,415,202
391 4,415,203

CLASS 299

1 4,415,204
5 4,415,205
17 4,415,206
18 4,415,207
91 4,415,208

CLASS 303

6 C 4,415,209
116 4,415,210

CLASS 307

243 4,415,815
265 4,415,816
454 4,415,817
465 4,415,818
481 4,415,819
491 4,415,820

CLASS 310

12 4,415,821
59 4,415,822
87 4,415,823
89 4,415,824
270 4,415,825
354 4,415,826
370 4,415,827

CLASS 312

206 4,415,211

CLASS 313

118 4,415,828
331 4,415,830
413 4,415,831
533 4,415,832
559 4,415,833
578 4,415,834
621 4,415,829
627 4,415,835

CLASS 315

50 4,415,836
177 4,415,837
248 4,415,838
308 4,415,839
323 4,415,840
400 4,415,841
411 4,415,842

CLASS 318

139 4,415,843
254 4,415,844
696 4,415,845
732 4,415,846

CLASS 320

2 4,415,847

CLASS 322

32 4,415,848
99 4,415,849

CLASS 324

51 4,415,850
4,415,851
57 N 4,415,852
74 4,415,853
79 R 4,415,854
114 4,415,855
208 4,415,856
357 4,415,857
438 4,415,858
442 4,415,859

CLASS 328

22 4,415,860
58 4,415,861

CLASS 330

10 4,415,862
4,415,863
253 4,415,864
271 4,415,865
278 4,415,866
287 4,415,867
294 4,415,868

CLASS 331

111 4,415,869
176 4,415,870

CLASS 333

1.1 4,415,871
18 4,415,872

CLASS 336

139 4,415,873
178 4,415,874

CLASS 337

62 4,415,875

CLASS 338

34 4,415,876
4,415,877
4,415,878

CLASS 339

17 C 4,415,212
49 R 4,415,213
91 R 4,415,214
98 4,415,215
107 4,415,216
113 L 4,415,217
147 R 4,415,218
195 M 4,415,219
221 R 4,415,220
258 F 4,415,221
270 R 4,415,222
276 R 4,415,223

CLASS 340

27 NA 4,415,879
347 AD 4,415,881
4,415,882
347 DA 4,415,883
500 4,415,884
552 4,415,885
618 4,415,886
635 4,415,887
684 4,415,888
728 4,415,889
749 4,415,890
753 4,415,891
767 4,415,892
825.31 4,415,893
825.57 4,415,894
856 4,415,895
870.03 4,415,896

CLASS 343

5 SA 4,415,898
5 SM 4,415,897
413 4,415,899
700 MS 4,415,900
754 4,415,901
844 4,415,902

CLASS 346

1.1 4,415,903
4,415,904
4,415,905
74.5 4,415,906
76 PH 4,415,907
4,415,908

140 R 4,415,909
4,415,910
4,415,911
154 4,415,912
4,415,913
4,415,914
160 4,415,915

CLASS 350

3.71 4,415,224
3.84 4,415,225
96.14 4,415,226
96.15 4,415,227
96.20 4,415,228
4,415,229
96.21 4,415,232
96.33 4,415,230
173 4,415,233
269 4,415,231
310 4,415,234
319 4,415,235
338 4,415,236
432 4,415,238
433 4,415,239
442 4,415,240
476 4,415,241
581 4,415,242

CLASS 351

201 4,415,243

CLASS 353

101 4,415,244

CLASS 354

25 4,415,245
4,415,246
33 4,415,247
43 4,415,248
173 4,415,249
195 4,415,250
230 4,415,251
234 4,415,252
292 4,415,253

CLASS 355

3 R 4,415,255
3 SH 4,415,263
3 TR 4,415,254
4,415,256
4,415,257
8 4,415,258
11 4,415,259
14 SH 4,415,260
75 4,415,261
125 4,415,262

CLASS 356

315 4,415,264
338 4,415,265
350 4,415,266

CLASS 357

29 4,415,916
70 4,415,917

CLASS 358

22 4,415,922
23 4,415,918
26 4,415,919
37 4,415,920
41 4,415,923
50 4,415,924
75 4,415,925
107 4,415,926
139 4,415,921
4,415,927
140 4,415,928
171 4,415,929
191.1 4,415,930
242 4,415,931
246 4,415,932
281 4,415,933
294 4,415,934
320 4,415,935
322 4,415,936
335 4,415,937

CLASS 360

53 4,415,938
75 4,415,939
99 4,415,940
106 4,415,941
135 4,415,942

CLASS 361

22 4,415,943
42 4,415,944
100 4,415,945
212 4,415,946
235 4,415,947
283 4,415,948
296 4,415,949
433 4,415,950

CLASS 362

20 4,415,951
32 4,415,952
4,415,953
4,415,954
225 4,415,955
269 4,415,956
297 4,415,957
301 4,415,958

CLASS 363

21 4,415,959
4,415,960
43 4,415,961
131 4,415,962
135 4,415,963
142 4,415,964

CLASS 364

136 4,415,965
162 4,415,966
168 4,415,967
178 4,415,968
200 4,415,969
4,415,970
4,415,971
4,415,972
4,415,973
426 4,415,974
444 4,415,975
472 4,415,976
474 4,415,977
475 4,415,978
508 4,415,979
518 4,415,981
527 4,415,982
708 4,415,983
900 4,415,984
4,415,985
4,415,986

CLASS 365

12 4,415,987
16 4,415,988
19 4,415,989
41 4,415,990
77 4,415,991
94 4,415,992
184 4,415,993
189 4,415,994
190 4,415,995

CLASS 366

14 4,415,267
85 4,415,268
132 4,415,269
165 4,415,275
216 4,415,270

CLASS 367

8 4,415,996
15 4,415,997
25 4,415,998
73 4,415,999
81 4,416,000

CLASS 368

41 4,415,271
69 4,415,272
74 4,415,273
160 4,415,274
187 4,415,276
190 4,415,277

CLASS 369

44 4,416,001
4,416,002
60 4,415,772
75.2 4,416,003
77.2 4,416,004
173 4,416,005
240 4,416,006

CLASS 370

62 4,416,007
88 4,416,008
100 4,416,009

CLASS 371

37 4,416,010

CLASS 372

45 4,416,011
4,416,012
96 4,416,013

CLASS 373

93 4,416,014

CLASS 374

37 4,415,278
204 4,415,279

CLASS 375

14 4,416,015
85 4,416,016
99 4,416,017

CLASS 376

216 4,415,524
317 4,415,525
409 4,415,526

CLASS 378

2 4,416,018
4,416,019
58 4,415,980
181 4,416,020
4,416,021
206 4,416,022

CLASS 381

10 4,415,768
45 4,415,767

CLASS 382

27 4,415,880

CLASS 384

103 4,415,280
4,415,281

CLASS 400

30 4,415,282
94 4,415,283
134 4,415,284
196.1 4,415,285
279 4,415,286
322 4,415,287

CLASS 401

132 4,415,288

CLASS 402

17 4,415,289
26 4,415,290

CLASS 403

36 4,415,291
246 4,415,292

CLASS 405

216 4,415,293
259 4,415,294
291 4,415,295

CLASS 406

19 4,415,296
168 4,415,297

CLASS 410

69 4,415,298

CLASS 411

340 4,415,299

CLASS 414

24.5 4,415,300
31 4,415,301
417 4,415,302
519 4,415,303
589 4,415,304
753 4,415,305

CLASS 415

2 A 4,415,306
12 4,415,307
72 4,415,308
170 R 4,415,309

CLASS 416

95 4,415,310
117 4,415,311
119 4,415,312

CLASS 417

38 4,415,313
131 4,415,314
269 4,415,315

CLASS 418

48 4,415,316
55 4,415,317
4,415,318
135 4,415,319
150 4,415,320
179 4,415,321
260 4,415,322

CLASS 419

31 4,415,527
46 4,415,528

CLASS 420

434 4,415,529
453 4,415,530
564 4,415,531
585 4,415,532

CLASS 422

4 4,415,533
58 4,415,534
143 4,415,535
159 4,415,536
180 4,415,537
224 4,415,538
304 4,415,539

CLASS 423

99 4,415,540
140 4,415,541
141 4,415,542
178 4,415,543
328 4,415,544
348 4,415,545

CLASS 424

1.1 4,415,546
19 4,415,547
28 4,415,548
52 4,415,549
57 4,415,550
65 4,415,551
91 4,415,552
95 4,415,553
145 4,415,554
147 4,415,555
153 4,415,556
172 4,415,557
177 4,415,558
183 4,415,559
184 4,415,560
219 4,415,561
244 4,415,563
4,415,564
245 4,415,565
246 4,415,562
4,415,566
4,415,567
248.4 4,415,568
248.57 4,415,569
249 4,415,570
250 4,415,571
4,415,572
251 4,415,573
4,415,574
4,415,575
252 4,415,576
258 4,415,577
263 4,415,578
4,415,579
4,415,580
267 4,415,581
4,415,582
269 4,415,583
272 4,415,584
273 P 4,415,585
273 R 4,415,586
4,415,587
311 4,415,588
4,415,589
319 4,415,590
330 4,415,591
331 4,415,592

CLASS 425

72 S 4,415,323
83.1 4,415,324
397 4,415,325

CLASS 426

4 4,415,593
36 4,415,594
101 4,415,595
103 4,415,596
394 4,415,597
4,415,598
578 4,415,599
613 4,415,600
659 4,415,601

CLASS 427

39 4,415,602
54.1 4,415,603
4,415,604
65 4,415,605
90 4,415,606
96 4,415,607
244 4,415,608
249 4,415,609
372.2 4,415,610

CLASS 428

15 4,415,611
29 4,415,612
36 4,415,613
38 4,415,614
40 4,415,615
48 4,415,616
86 4,415,617
88 4,415,618
131 4,415,619
157 4,415,620
172 4,415,621
198 4,415,622
200 4,415,623
209 4,415,624
222 4,415,625
323 4,415,626
332 4,415,627
335 4,415,628
375 4,415,629
403 4,415,630
405 4,415,631
408 4,415,632
411 4,415,633
579 4,415,634
611 4,415,635

CLASS 429

27 4,415,636
218 4,415,637
225 4,415,638

CLASS 430

57 4,415,639
59 4,415,640
4,415,641
86 4,415,642
94 4,415,643
106.6 4,415,644
107 4,415,645
110 4,415,646
213 4,415,647
220 4,415,648
271 4,415,649
273 4,415,650
277 4,415,651
4,415,652
296 4,415,653
328 4,415,654

CLASS 431

1 4,415,328
125 4,415,329

CLASS 433

16 4,415,330

CLASS 434

113 4,415,326
249 4,415,327

CLASS 435

17 4,415,655
96 4,415,656
106 4,415,657
122 4,415,658
161 4,415,659
172 4,415,660
174 4,415,661
176 4,415,662
4,415,663
4,415,664
179 4,415,665
4,415,666
212 4,415,667
241 4,415,668
253 4,415,669
285 4,415,670

CLASS 436

29 4,415,671

CLASS 455

291 4,416,023
303 4,416,024

CLASS 501

4 4,415,672
102 4,415,673
104 4,415,674

CLASS 502

62 4,415,481
85 4,415,479
100 4,415,485
117 4,415,474
178 4,415,477
181 4,415,478
205 4,415,482
206 4,415,475
224 4,415,476
242 4,415,480
255 4,415,483
332 4,415,484

CLASS 518

715 4,415,675
4,415,676

CLASS 521

28 4,415,677
4,415,678
31 4,415,679
56 4,415,680

CLASS 523

334 4,415,681
403 4,415,682
404 B1 4,174,332

CLASS 524

43 4,415,683
92 4,415,684
4,415,685
101 4,415,686
102 4,415,687
4,415,688
103 4,415,689
112 4,415,690
114 4,415,691
183 4,415,692
198 4,415,693
200 4,415,694
405 4,415,695
490 4,415,696
512 4,415,697
521 4,415,698
538 4,415,699
548 4,415,700
612 4,415,701
705 4,415,702

CLASS 525

54.2 4,415,490
54.21 4,415,703
76 4,415,704
167.5 4,415,705
183 4,415,706
231 4,415,707
316 4,415,708
344 4,415,709
370 4,415,710

CLASS 526

88 4,415,711
98 Re.31,443
122 4,415,712
125 4,415,713
4,415,714
142 4,415,715
209 4,415,716
272 B1 4,358,573
287 4,415,717
348.6 4,415,718

CLASS 528

167 4,415,719
171 4,415,720
176 4,415,721
196 4,415,722
204 4,415,723
4,415,724
4,415,725
272 4,415,726
4,415,727
279 4,415,728
388 4,415,729

CLASS 536

7.1 4,415,730
18.4 4,415,731
27 4,415,732
53 4,415,733
76 4,415,734

CLASS 544

22 4,415,735

CLASS 546

283 4,415,736

CLASS 548

146 4,415,737
147 4,415,738
367 4,415,739

CLASS 549

273 4,415,740
345 4,415,741
475 4,415,742
491 4,415,743

CLASS 560

20 4,415,744
25 4,415,745
61 4,415,746
112 4,415,747
227 4,415,748
232 4,415,749

CLASS 562

467 4,415,750
478 4,415,751
534 4,415,752

CLASS 564

418 4,415,753
423 4,415,754
480 4,415,755

CLASS 568

365 4,415,756
475 4,415,757

CLASSIFICATION OF DESIGNS

D1—	12	271,344			271,360			271,376	D14—	11	271,392			271,408	D26—	26	271,424
D2—	184	271,345			271,361	D9—	378	271,377		63	271,393		207	271,409			271,425
	231	271,346	D7—	70	271,362		424	271,378		66	271,394		225	271,410		29	271,426
	232	271,347		137	271,363	D10—	38	271,379	D15—	7	271,395	D22—	5	271,411		85	271,427
	331	271,348			271,364		49	271,380		24	271,396		7	271,412			271,428
D3—	35	271,349			271,365		62	271,381		25	271,397		14	271,413		104	271,429
	62	271,350			271,366		65	271,382		27	271,398		20	271,414	D28—	13	271,430
D6—	16	271,351		363	271,367		126	271,383	D16—	130	271,399		27	271,415		64	271,431
	29	271,352		398	271,368	D11—	76	271,384	D17—	17	271,400	D23—	4	271,416	D29—	7	271,432
	104	271,353	D8—	10	271,369		131	271,385		22	271,401		71	271,417	D30—	13	271,433
	175	271,354		14	271,370		133	271,386	D19—	92	271,402	D24—	26	271,418		15	271,434
	183	271,355		51	271,371		145	271,387	D21—	114	271,403		28	271,419		99	271,435
	188	271,356		88	271,372	D12—	104	271,388		150	271,404		36	271,420			
	198	271,357		302	271,373		158	271,389		166	271,405		53	271,421	D32—	14	271,436
	234	271,358		353	271,374		327	271,390		185	271,406		56	271,422		58	271,437
		271,359		382	271,375	D13—	5	271,391		197	271,407	D25—	77	271,423	D34—	43	271,438

CLASSIFICATION OF PLANTS

P.—	38	5,137		39	5,138		43	5,139		5,140	

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,415,080
4,415,152
4,415,774
4,415,810
4 : 4,415,235
4,415,395
4,415,992
6 : 4,414,697
4,414,701
4,414,738
4,414,739
4,414,749
4,414,785
4,414,795
4,414,807
4,414,812
4,414,848
4,414,886
4,414,917
4,414,951
4,414,966
4,414,969
4,414,981
4,414,985
4,414,993
4,415,001
4,415,014
4,415,138
4,415,151
4,415,200
4,415,203
4,415,253
4,415,286
4,415,301
4,415,339
4,415,351
4,415,353
4,415,365
4,415,371
4,415,373
4,415,528
4,415,539
4,415,546
4,415,558
4,415,563
4,415,599
4,415,608
4,415,618
4,415,662
4,415,671
4,415,767
4,415,794
4,415,827
4,415,860
4,415,892
4,415,897
4,415,900
4,415,953
4,415,954
4,415,987
4,415,990
4,415,991
4,416,022
8 : 4,414,771
4,414,891
4,415,042
4,415,438
4,415,732
4,415,759
4,415,773
4,415,800
4,415,998
9 : 4,414,714
4,414,719
4,414,832
4,414,871
4,414,872
4,415,017
4,415,394
4,415,402
4,415,405
4,415,604
4,415,636
4,415,672
4,415,693
4,415,796
4,415,855
4,415,948
01 : 4,414,801
4,414,975
04 : 4,414,935
4,415,115
4,415,242
4,415,267
4,415,780
06 : 4,414,713
4,414,736
4,414,786
4,414,792
4,414,853
4,414,865
4,414,906
4,414,924
4,414,932
4,414,973
4,414,992
4,414,994
4,414,996
4,414,997
4,415,018
4,415,056
4,415,063
4,415,076
4,415,095
4,415,101
4,415,110
4,415,136
4,415,150
4,415,165
4,415,169
4,415,176
4,415,177
4,415,182
4,415,191
4,415,206
4,415,216
4,415,217
4,415,239
4,415,269
4,415,275
4,415,330
4,415,352
4,415,462
4,415,491
4,415,493
4,415,503
4,415,513
4,415,526
4,415,612
4,415,661
4,415,760
4,415,771
4,415,839
4,415,844
4,415,858
4,415,867
4,415,885
4,415,889
4,415,893
4,415,915
4,415,941
4,415,960
4,415,963
4,415,964
4,415,967
4,415,972
4,415,980
4,415,986
08 : 4,414,711
4,414,851
4,414,957
4,415,158
4,415,163
4,415,430
4,415,432
4,415,542
4,415,609
4,415,913
09 : 4,414,776
4,414,816
4,414,884
4,414,963
4,415,112
4,415,172
4,415,190
4,415,212
4,415,264
4,415,280
4,415,281
4,415,307
4,415,377
4,415,484
4,415,537
4,415,617
4,415,772
4,415,884
4,416,021
10 : 4,414,916
4,415,651
4,415,652
4,415,754
4,415,802
11 : 4,414,721
4,414,885
12 : 4,414,695
4,414,760
4,414,774
4,414,777
4,414,790
4,414,926
4,414,961
4,415,021
4,415,075
4,415,099
4,415,103
4,415,159
4,415,211
4,415,219
4,415,511
4,415,525
4,415,601
4,415,673
4,415,852
4,415,873
4,415,891
13 : 4,414,768
4,415,090
4,415,591
4,415,778
4,415,949
16 : 4,414,773
4,415,047
4,415,324
17 : 4,414,703
4,414,705
4,414,709
4,414,725
4,414,731
4,414,780
4,414,783
4,414,820
4,414,867
4,414,895
4,414,899
4,414,967
4,414,968
4,415,020
4,415,041
4,415,043
4,415,051
4,415,098
4,415,117
4,415,131
4,415,149
4,415,154
4,415,155
4,415,167
4,415,202
4,415,327
4,415,336
4,415,346
4,415,348
4,415,382
4,415,387
4,415,393
4,415,412
4,415,433
4,415,434
4,415,444
4,415,452
4,415,479
4,415,483
4,415,524
4,415,585
4,415,656
4,415,663
4,415,664
4,415,784
4,415,842
4,415,843
4,415,849
4,415,921
4,415,930
4,415,932
4,416,001
4,416,017
18 : 4,414,728
4,414,874
4,415,002
4,415,068
4,415,085
4,415,325
4,415,355
4,415,386
4,415,423
4,415,532
4,415,590
4,415,666
4,415,696
4,415,722
4,415,723
4,415,724
4,415,725
4,415,751
4,415,788
4,415,812
4,415,841
4,415,956
4,416,007
19 : 4,414,708
4,414,863
4,415,052
4,415,175
4,415,197
4,415,300
4,415,303
4,415,790
20 : 4,414,717
4,414,843
4,414,974
4,415,975
21 : 4,414,841
4,415,134
4,415,188
4,415,284
4,415,833
4,416,020

22 : 4,414,754
4,414,799
4,415,283
4,415,366
4,415,435
4,415,441
4,415,502
4,415,707
4,415,997
23 : 4,415,428
24 : 4,414,791
4,414,912
4,415,086
4,415,130
4,415,137
4,415,439
4,415,551
4,415,807
4,415,896
4,415,898
4,415,974
4,415,979
4,415,993
4,416,013
25 : 4,414,741
4,414,750
4,414,784
4,414,829
4,414,892
4,414,922
4,414,930
4,415,003
4,415,100
4,415,183
4,415,225
4,415,251
4,415,266
4,415,401
4,415,403
4,415,427
4,415,498
4,415,610
4,415,648
4,415,660
4,415,668
4,415,675
4,415,676
4,415,737
4,415,829
4,415,834
4,415,946
4,415,958
4,415,962
26 : Re.31,444
4,414,720
4,414,723
4,414,724
4,414,729
4,414,733
4,414,805
4,414,809
4,414,811
4,414,822
4,414,839
4,414,842
4,414,855
4,414,879
4,414,902
4,414,925
4,414,955
4,415,016
4,415,054
4,415,074
4,415,091
4,415,105
4,415,141
4,415,146
4,415,166
4,415,189
4,415,194
4,415,291
4,415,299
4,415,369
4,415,391
4,415,466
4,415,516
4,415,531
4,415,583
4,415,655
4,415,681
4,415,683
4,415,697
4,415,749
4,415,847
4,415,875
4,415,878
4,415,985
4,416,023
27 : 4,414,704
4,414,854
4,414,923
4,414,931
4,414,986
4,415,013
4,415,282
4,415,396
4,415,598
4,415,615
4,415,653
4,415,694
4,415,782
4,415,894
4,415,970
28 : 4,415,450
29 : 4,415,065
4,415,093
4,415,374
4,415,575
4,415,397
4,415,417
4,415,482
4,415,744
4,415,753
30 : 4,415,092
31 : 4,414,903
4,415,011
4,415,106
4,415,156
4,415,162
4,415,292
33 : 4,415,801
4,415,872
34 : Re.31,439
4,414,837
4,414,868
4,414,907
4,414,921
4,414,990
4,415,062
4,415,077
4,415,081
4,415,089
4,415,122
4,415,220
4,415,222
4,415,263
4,415,270
4,415,288
4,415,349
4,415,379
4,415,380
4,415,388
4,415,409
4,415,414
4,415,426
4,415,436
4,415,437
4,415,443
4,415,460
4,415,468
4,415,480
4,415,489
4,415,496
4,415,518
4,415,521
4,415,544
4,415,560
4,415,568
4,415,581
4,415,587
4,415,593
4,415,624
4,415,649
4,415,698
4,415,701
4,415,705
4,415,709
4,415,710
4,415,711
4,415,731
4,415,742
4,415,745
4,415,803
4,415,871
4,415,901
4,415,906
4,415,918
4,415,931
4,415,959
4,415,978
4,416,011
4,416,012
4,416,015
4,416,016
35 : 4,414,748
36 : 4,414,692
4,414,693
4,414,698
4,414,712
4,414,788
4,414,834
4,414,911
4,414,954
4,414,960
4,415,024
4,415,025
4,415,084
4,415,087
4,415,113
4,415,121
4,415,157
4,415,160
4,415,173
4,415,213
4,415,215
4,415,230
4,415,234
4,415,244
4,415,245
4,415,258
4,415,265
4,415,289
4,415,296
4,415,323
4,415,338
4,415,344
4,415,357
4,415,363
4,415,469
4,415,478
4,415,481
4,415,501
4,415,506
4,415,515
4,415,547
4,415,549
4,415,578
4,415,580
4,415,613
4,415,621
4,415,626
4,415,639
4,415,646
4,415,647
4,415,721
4,415,740
4,415,746
4,415,783
4,415,808
4,415,840
4,415,851
4,415,853
4,415,856
4,415,905
4,415,909
4,415,910
4,415,914
4,415,943
4,415,955
4,415,976
37 : 4,414,904
4,414,956
4,415,044
4,415,224
4,415,389
4,415,779
4,415,961
39 : Re.31,442
4,414,726
4,414,778
4,414,797
4,414,852
4,414,877
4,414,880
4,414,964
4,414,991
4,415,049
4,415,067
4,415,114
4,415,132
4,415,187
4,415,226
4,415,228
4,415,229
4,415,328
4,415,390
4,415,398
4,415,406
4,415,420
4,415,473
4,415,474
4,415,475
4,415,520
4,415,600
4,415,606
4,415,684
4,415,686
4,415,690
4,415,695
4,415,704
4,415,715
4,415,830
4,415,835
4,415,902
40 : Re.31,443
4,415,005
4,415,033
4,415,034
4,415,036
4,415,129
4,415,367
4,415,431
4,415,440
4,415,442
4,415,459
4,415,714
4,415,729
4,415,857
4,416,000
41 : 4,414,775
4,414,813
4,414,875
4,415,171
4,415,861
4,415,927
4,415,969
42 : 4,414,715
4,414,716
4,414,770
4,414,793
4,414,796
4,414,814
4,414,823
4,414,858
4,414,888
4,414,915
4,414,959
4,414,982
4,414,998
4,415,064
4,415,078
4,415,116
4,415,147
4,415,179
4,415,180
4,415,204
4,415,208
4,415,223
4,415,232
4,415,278
4,415,294
4,415,297
4,415,332
4,415,334
4,415,341
4,415,345
4,415,354
4,415,376
4,415,378
4,415,410
4,415,415
4,415,425
4,415,455
4,415,527
4,415,545
4,415,575
4,415,576
4,415,622
4,415,628
4,415,629
4,415,638
4,415,654
4,415,670
4,415,679
4,415,706
4,415,736
4,415,748
4,415,762
4,415,763
4,415,825
4,415,832
4,415,928
4,415,984
4,415,996
43 : 4,414,691
44 : 4,415,164
4,415,287
45 : 4,414,696
4,414,710
4,414,744
4,414,756
4,414,844
4,415,061
4,415,331
4,415,548
46 : 4,415,350
47 : 4,414,772
4,414,870
4,415,071
4,415,139
4,415,199
4,415,237
4,415,416
4,415,446
4,415,536
4,415,543
4,415,674
4,415,837
4,415,926
4,416,014
48 : 4,414,734
4,414,759
4,414,769
4,414,817
4,414,846
4,414,909
4,414,918
4,414,936
4,414,965
4,414,995
4,415,027
4,415,028
4,415,029
4,415,030
4,415,031
4,415,032
4,415,035
4,415,037
4,415,038
4,415,045
4,415,174
4,415,181
4,415,193
4,415,205
4,415,218
4,415,293
4,415,337
4,415,453
4,415,463
4,415,507
4,415,517
4,415,677
4,415,678
4,415,691
4,415,712
4,415,717
4,415,755
4,415,805
4,415,859
4,415,879
4,415,880
4,415,895
4,415,951
4,415,983
4,415,999
4,416,009
3,962,136
49 : 4,414,962
4,415,817
4,415,939
51 : 4,414,747
4,414,824
4,414,987
4,414,999
4,415,133
4,415,311
4,415,312
4,415,456
4,415,635
4,415,821
4,415,850
53 : 4,414,919
4,415,066
4,415,140
4,415,184
4,415,512
4,415,768
54 : 4,414,836
4,415,207
4,415,530
4,415,719
4,415,747
4,415,752
55 : Re.31,441
4,414,700
4,414,707
4,414,751
4,414,757
4,414,808
4,414,861
4,414,933
4,414,934
4,414,940
4,414,977
4,415,006
4,415,019
4,415,022
4,415,073
4,415,317
4,415,318
4,415,342
4,415,592
4,415,605
4,415,607
4,415,781
4,415,957
4,358,573

DESIGN PATENTS

04 : 271,390
05 : 271,400
06 : 271,345
271,346
271,350
271,358
271,359
271,360
271,361
271,371
271,372
271,382
271,383
271,386
271,411
271,434
08 : 271,419
271,433
09 : 271,369
271,377
271,388
271,389
271,394
12 : 271,355
271,375
271,376
271,391
271,437
13 : 271,395
271,421
271,422
17 : 271,398
18 : 271,401
25 : 271,354
271,356
271,427
271,428
26 : 271,407
27 : 271,368
29 : 271,412
34 : 271,378
271,424
271,430
36 : 271,344
271,363
271,364
271,365
271,366
271,385
271,399
271,409
271,414
271,431
37 : 271,348
271,374
271,381
38 : 271,397
39 : 271,402
271,406
271,413
271,415
271,416
271,436
271,438
42 : 271,373
271,403
271,418
271,432
44 : 271,370
47 : 271,384
271,387
48 : 271,408
271,420
51 : 271,405
55 : 271,351
271,357

PLANT PATENTS

06 : 5,137
5,138
5,139
5,140

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